BIGHORN CANYON NATIONAL RECREATION AREA

RECLAMATION OF ABANDONED URANIUM EXPLORATION SITES

ENVIRONMENTAL ASSESSMENT

MAY 2003

Environmental Assessment

Reclamation of Abandoned Uranium Exploration Sites

Bighorn Canyon National Recreation Area

Carbon County, Montana and Bighorn County, Wyoming

SUMMARY

Bighorn Canyon National Recreation Area proposes to reclaim 244 pit and mound excavations created by uranium exploration in the late 1950's in order to increase public outdoor recreation benefits, increase recreation area scenic values and restore disturbed landscapes to as pristine a condition as possible. The pit and mound excavations would be re-contoured to a natural appearing profile using either appropriate mechanical equipment or hand tools, depending upon the size of the excavation, soil friability, proximity to the old mining access roads and proximity to sensitive cultural and natural resources. After restoring a natural appearing contour, the excavations would be planted with native seed of the same species as the surrounding area. The reclaimed sites would be monitored for noxious weeds until native vegetation is restored to a density of about 70% of the plant density of the surrounding area. The proposed action would have no impact on ethnographic resources and cultural landscapes, water resources, recreation area operations, historic structures, museum collections, prime and unique farmlands, air quality, soundscape management, lightscape management, socioeconomic environment or environmental justice. Impact to soils could be adverse but minor and short-term. Adverse impacts to biotic communities and threatened and endangered species would be negligible and short-term. There would be no adverse impacts to visual resources and topography or visitor use and experience. Beneficial impacts to biotic communities, visitor use and experience and visual resources and topography would be moderate and long-term.

PUBLIC COMMENT

If you wish to comment on the environmental assessment, you may mail comments to the name and address below. Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Individual respondents may request that we withhold their address from the record, which we will honor to the extent allowable by law. **If you wish to withhold your address, you must state this prominently at the beginning of your comment.** We will make all submissions from organizations or businesses and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

Please address comments to:

Suzanne Morstad
Bighorn Canyon National Recreation Area
20 Hwy 14A, Lovell, Wyo. 82431
or:
Suzanne_Morstad@nps.gov.

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PURPOSE AND NEED

PURPOSE

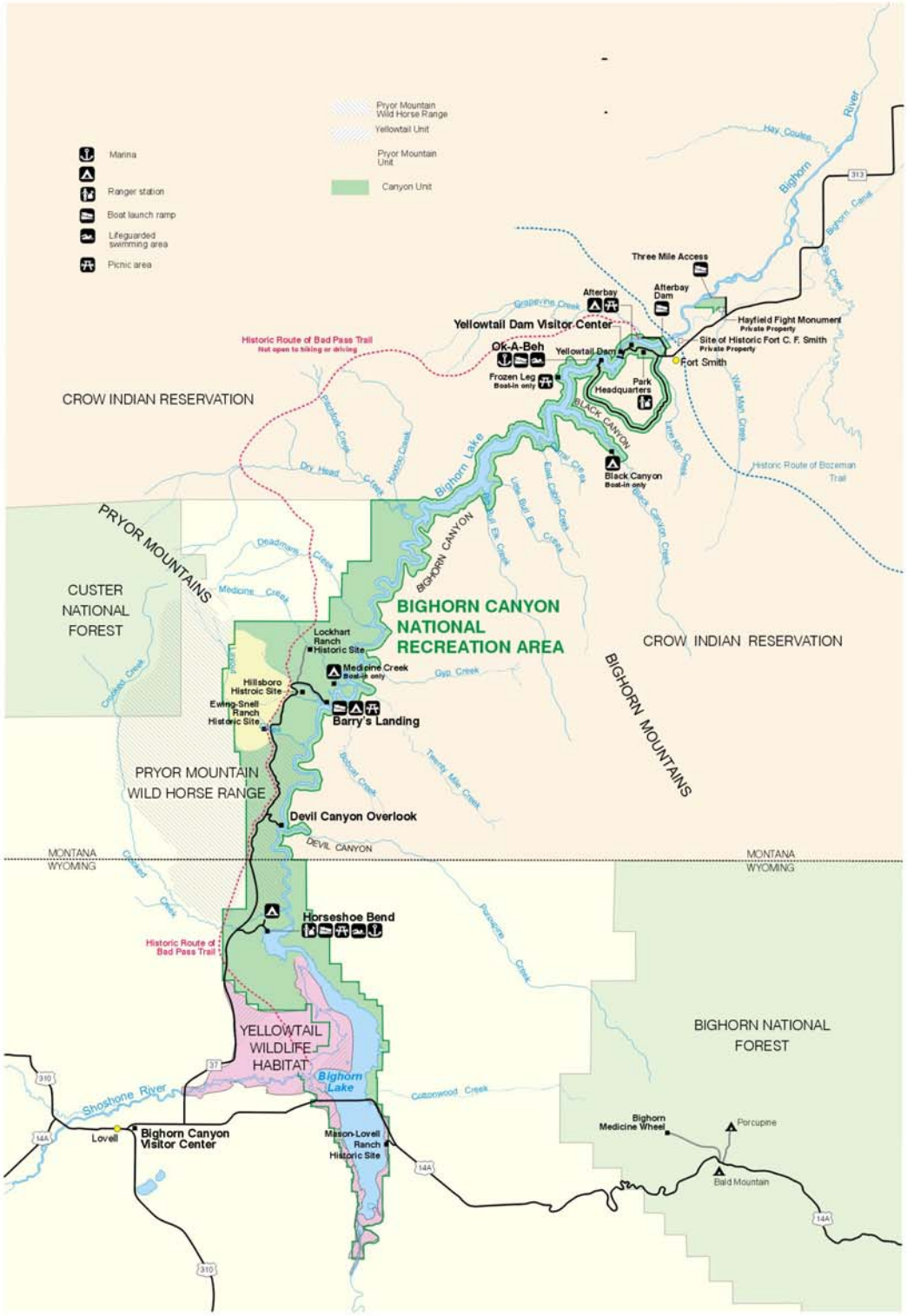
Bighorn Canyon National Recreation Area was established by an act of Congress (Public Law 89-64, 16 USC 460t) on October 15, 1966 "to provide for public outdoor recreation use and enjoyment of Yellowtail Reservoir and lands adjacent thereto … and for the preservation of scenic, scientific and historic features contributing to public enjoyment of such lands and waters."

The significance of Bighorn Canyon National Recreation Area lies in the scenic and recreational values of Bighorn Lake and its canyon. The park has a history of over 10,000 years of human use including historic ranches from the 1880's through the 1950's. It is home to the Pryor Mountain Wild Horses since a third of the Pryor Mountain Wild Horse Range is on Bighorn Canyon National Recreation Area lands. Much of the wild horse range is shared with Rocky Mountain bighorn sheep. The Park is situated at the northern end of the Great Basin Desert where the desert meets the Rocky Mountains meets the Northern Plains. This gives the Park tremendous diversity in its biotic communities in spite of the years of human use. (See Map) The Park's purpose is 1) to provide for public outdoor recreation use and enjoyment of Bighorn Canyon, the Yellowtail Reservoir and adjacent lands and 2) protect, restore and maintain the natural and cultural resources while managing them within their broader ecosystem and cultural context.

NEED

Bighorn Canyon National Recreation Area has over 350 abandoned uranium exploration sites created from 1956 through 1960. These sites are in scattered clusters throughout the park from Crooked Creek to South Pasture. They vary in size from small D6 caterpillar scoops to large complex excavations of ½ acre. In the arid climate of Bighorn Canyon NRA, there has been little natural regeneration since the sites were excavated.

The uranium exploration sites are located in scattered clusters through out the South District of Bighorn Canyon NRA between Horseshoe Bend and Deadman Creek (See Map). Many of these exploration sites still show the two-track mining roads used for access. Some of these mining two track roads have good potential or are currently being used as trails. The exploration sites are all well off the main road and current access is by foot though many of the old mining roads are intact enough to easily be used by a four wheel drive vehicle or backhoe when the soil is dry.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Bighorn Canyon National Recreation Area is proposing a reclamation plan for these former uranium exploration sites, which are now considered abandoned mineral lands (AML's). The objectives of the proposed action are to: 1) re-contour the AML's to a natural looking appearance that approximates the contour and hydrology before the disturbance. 2) Revegetate the AML's with native plants of the same species as the plants in the areas contiguous to each site and 3) Do the reclamation with as little disturbance as possible to the contiguous areas. Reclamation of disturbances in this desert is a slow process, but it would be expected that three years after re-contouring these sites, there would be a marked improvement in appearance with early native plant growth and no noxious weeds. After 10 years the evidence of the previous AML's should be discernable only to a person trained to look for such sites.

Action is needed because: 1) These abandoned mineral lands are exceptionally distracting from the visitors esthetic enjoyment of the park. 2) Some of the larger and deeper sites are near old mining access roads that are being used for visitor use trails have a risk of danger in case of inappropriate visitor use. 3) The greater than 15 acres of disturbed land in these abandoned uranium exploration sites represents a loss of forage for native grazing animals in a desert area that is always short of forage. 4) In some areas, the excavations are so dense that there is fragmentation of the habitat. 5) While currently there are no noxious weeds on these sites, the potential for noxious weeds exists as long as a competing population of native plants does not cover these sites.

Scoping

Scoping is an early and open process to determine the breadth of environmental issues and alternatives to be addressed in an environmental assessment. Bighorn Canyon National Recreation Area has conducted both internal scoping with appropriate National Park Service staff and external scoping with the public and affected groups and agencies.

The staff of Bighorn Canyon National Recreation Area and resource professionals of the National Park Service's Denver and Santa Fe support offices conducted internal scoping. This interdisciplinary process defined the need, determined what the likely issues and impact topics would be, and identified the relationship, if any of the proposed action to other planning efforts in the monument.

A news release describing the proposed action was issued on January 15, 2002 (Appendix A). Copies of the Scoping Statement (See Appendix B) and cover letters were also sent to associated

agencies including local BLM offices and Custer National Forest. A letter describing the proposed action was also sent to the Crow Tribal Chairman (Appendix D). Comments were solicited during the external scoping until February 15, 2001. The suggestions from the external scoping were incorporated into the environmental assessment. Suggestions included doing interviews with people who have lived in the area and search of records to determine the exact years the AML's were created and the significance of these sites. Such people were found and interviewed. Several potential references for the extent and location of archeological sites were given and used. A recommendation was made for including soil analysis in the preferred alternative.

The undertakings described in this document are subject to Section 106 of the National Historic Preservation Act, as amended in 1992 (16 USC 470 *et seq*.) The proposed plan was discussed with a NPS archeologist/historian during its inception and with Montana SHPO. An Assessment of Effect was developed by a NPS historian/archeologist and sent to SHPO of Montana and Wyoming to fulfill Bighorn Canyon National Recreation Area's obligations under Section 106(36 CFR 800.8[c], Use of NEPA process for section 106 purposes)

Relationship Of The Proposed Action To Previous Planning Efforts

The reclamation project is consistent with the objectives of Bighorn Canyon National Recreation Area's Resource Management Plan (1995) as well the Bighorn Canyon National Recreation Area Strategic Plan, 2001-2005 (2001).

IMPACT TOPICS

Specialists in the National Park Service and Montana SHPO identified issues and concerns affecting the proposed action. Specific impact topics were developed to ensure that alternatives were compared on the basis of the most relevant topics. The following impact topics were identified the basis of federal laws, regulation, orders and the National Park Service *Management Policies, 2001*(2000). A brief rationale for the selection of each impact topic is given below, as well as the rationale for dismissing specific topics from further consideration.

Soils

According to the National Park Service's *Management Policies 2001*(2000), the National Park Service will strive to understand and preserve the soil resources of the park units and prevent, to the extent possible, the unnatural erosion, physical removal or contamination of the soil or its contamination of other resources.

The soils of Bighorn Canyon National Recreation Area are diverse, reflecting the complex geology of the area. The skeletal, poorly developed soils located on the rocky plateaus are quite resistant to damage from compression from heavy machinery, especially when dry. The pink clay soils and soils derived from the Chugwater Formation (a Triassic siltstone) compact easily if damp. When dry, they are friable and use of heavy machinery may leave visible marks that take years to erase naturally. The proposed action has the potential to impact soils through increased erosion or compaction so soils will be addressed as an impact topic.

Biotic Communities

The National Environmental Policy Act of 1969 (42 USC 4321 *et seq*.) calls for examination of the impacts on all the components of the affected ecosystems. National Park Service policy is to maintain all the components and processes of naturally evolving park ecosystems, including the natural abundance, diversity and ecological integrity of plants and animals. (National Park Service *Management Policies, 2001*.)

The AML's are located in areas used by Rocky Mountain bighorn sheep, Pryor Mountain wild horses and mule deer as well as other birds and small animals of these open woodlands and grasslands. The basin grasslands and associated windswept plateaus are unique vegetative communities with many endemic plant species. There is potential for collateral damage to these plant communities from the use of heavy equipment on the larger AML's adjacent to the old mining roads. Even when an AML is recontoured by hand, there is a rim of collateral damage of about 10% of the size of the AML. Additional damage from reclamation activities must be minimized to protect biodiversity and ecosystem health. Potential for damage to biotic communities exists so it will be discussed as an impact topic.

Threatened, Endangered and Candidate Species and Species of Special Concern

The Endangered Species Act (1973) requires an examination of impacts on all federally-listed threatened or endangered species. National Park Service policy also requires examination of the impacts on federal candidate species as well as state listed threatened, endangered, candidate, rare, declining and sensitive species. The only federally threatened or endangered species in the park is the bald eagle. Bighorn Canyon National Recreation Area is home to several endemic plant species of concern including: Sullivantia hapemanii, Rorippa calycina, Erigeron allocotus, Stanleya tomentosa, Astragalus oreganus and Eriogonum brevicaule var. canum. Since the last four species may be found

near the AML's, threatened, endangered and candidate species and species of special concern will be addressed as an impact topic.

Archeological Resources

Native Americans have used the Bighorn Canyon area for almost 10,000 years. The Bad Pass Trail, a route from the Great Plains to the Bighorn Basin parallels the park road through much of the park. The park has multiple archeological sites including rock structures, flaking sites, siege sites, vision quest sites, cairns and teepee rings. Under Section 106(36 CFR 800.8[c], *Use of NEPA process for section 106 purposes*), the park has an obligation to identify and protect archeological resources.

In the 1970's there were extensive inventories and mapping of these resources by several different researchers. While most of the identified sites are well away from the mapped AML's, in some areas the access to the AML's is close to the Bad Pass Trail. Since there is some potential for damage to the Bad Pass Trail and other unidentified artifacts, archeological resources will be addressed as a topic of concern.

Visual Resources and Topography

National Park Service *Management Policies 2001* (2000) require the protection of significant topographic features. The area is geologically very diverse with exposed strata from the Cambrian through the Cretaceous Periods, heavily faulted, uplifted, folded and eroded. The search for uranium in the late 1950's left gouges deep enough to change the topographic features of the park in three different areas (Devil Canyon Overlook, Barry's Island and south of Layout Creek Canyon). Because of the amount of visual disturbance, visual resources and topography will be addressed as a topic of concern.

Visitor Use and Experience

About 170 sites are located along old mining roads that are used as trails and proposed trails. Some of the AML's are deep enough to present a safety risk if used inappropriately by visitors. The multiple disturbances from mineral exploration are esthetically distracting and may result in an inappropriate visitor interpretation of the landscape. Since there is potential for impact upon the visitor's enjoyment of Bighorn Canyon National Recreation Area, visitor use and experience will be addressed as an impact topic.

IMPACT TOPICS DISMISSED FROM FURTHER CONSIDERATION

NPS specialists, as well as staff from other federal, state and local agencies identified issues and concerns affecting this project. After public scoping, issues and concern were distilled into distinct impact topics to facilitate the analysis of environmental consequences, which allows for a standardized comparison between alternatives based on the most relevant information. The impact topics were identified on the basis of federal laws, regulations and orders; NPS management policies and NPS knowledge of limited or easily impacted resources. The rationale for dismissing specific topics from further consideration is given below.

Ethnographic Resources and Cultural Landscapes

The National Historic Preservation Act, as amended in 1992 (16 USC 470 et seq.); the National Environmental Policy Act of 1969 (42 USC 4321 et seq.); and the National Park Services Director's Order #28, *Cultural Resource Management Guideline*(1997), *Management Policies, 2001* (2000) and Director's Order #12, *Conservation Planning, Environmental Impact Analysis, and Decision Making* (2001) require the consideration of impacts on ethnographic resources and cultural landscapes listed for or eligible to be listed in the National Register of Historic Places.

Ethnographic Resources: are defined by the National Park Service as any "site, structure, object, landscape or natural resource feature assigned traditional legendary, religious, subsistence or other significance in the cultural system of a group traditionally associated with it"(Director's Order #28, *Cultural Resource Management Guideline,* 1997.) Native Americans, especially the Crow Tribe, used the land where the AML's are located for many years. In 1851, Fort Laramie Treaty gave this land to the Crow Tribe. The Crow land where the AML's and most of Bighorn Canyon National Recreation Area are located was ceded back to the United States in the Fort Laramie treaty of 1868 to the State of Montana in 1891. None of the AML's are on or near Crow land. A letter was sent to the Crow Nation, the most recent Native American occupants of this area. No response was received concerning ethnographic resources in the area of the proposed action. However the Crow Nation has previously indicated what parts of the proposed Bighorn Canyon National Recreation Area they valued as part of the Crow National Heritage. In 1971, the Crow Tribal Council passed resolution 71-12, which specifically called for the preservation of the archeological resources of the Grapevine and Dryhead drainages. None of the AML's are in these areas.

Cultural Landscapes: According to the National Park Service's *Cultural Resource Management Guideline* (DO #28) a cultural landscape is… a reflection of human adaptation and use of natural

resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation and the types of structures that are built. The character of a cultural landscape is defined both by the physical materials, such as roads, buildings, walls and vegetation, and by use reflecting cultural values and traditions.

Thus, cultural landscapes are the result of the long interaction between man and the land, the influence of human beliefs and actions over time upon the natural landscape. Shaped through historical land-use and management practices as well as politics and property laws, levels of technology and economic conditions, cultural landscapes provide a living record of an area's past, a visual chronicle of its history. The dynamic nature of modern human life, however contributes to the continual reshaping of cultural landscapes; making them a good source of information about specific times and places, but at the same time rendering their long-term preservation a challenge.

Bighorn Canyon National Recreation Area is rich in cultural landscapes reflecting over 120 years of ranching, mining, tourism and irrigated agriculture. Four ranch sites within the park are on the National Register of Historic Places. Their cultural landscapes are not on the Historical Register for cultural landscapes but the cultural landscapes of three of the ranches are being considered for Historic District Status. The traditions of ranching continue today with cattle trailing and grazing in the park and the presence of part of the Pryor Mountain Wild Horse Range in the southern part of the park.

To learn more about the historical significance of the AML's, the Bighorn County Courthouse and City Offices of Lovell, Wyo. were contacted. Without the name of the company that did the mineral exploration, access to the records would be very difficult. Several people who lived in the Bighorn Canyon area in the 1950's were interviewed. They stated that the mining company was from out of state but none remembered the name of the company. A combination of local caterpillar operators and out of state people was used. The explorations occurred between 1956 and 1960. There were no historic people of note involved or unusual incidents. Uranium was not found and except for the temporary employment of local backhoe operators, there was no significant economic effect on the town of Lovell. Results of these interviews were relayed to Montana SHPO, the NPS Intermountain Region Support Office and the Historian/Archeologist of the BLM in Wyoming. All concurred that the AML's are less than 50 years old and unlikely to be of enough historical significance as to be eligible for the National Register of Historic Places.

There are no historic features on the excavation sites and they are well away from the historic ranches. The exception is a

historic fence line in South Pasture B that is near AML number AB49 that was reclaimed in 2001. This site was easily recontoured without disturbing the historic fence posts.

Ethnographic resources and cultural landscapes are excluded as topic of discussion because of the lack of proximity of the AML's to these resources in Bighorn Canyon National Recreation Area.

Water Resources (Water Quality, Wetlands and Floodplains)

National Park Service policies require protection of water quality consistent with the Clean Water Act. This includes protection of surface waters as well as underground aquifers and wetlands. Executive Order 11990*, Protection of Wetlands* and Executive Order 11988, *Floodplain Management*, require federal agencies to avoid, wherever possible, adversely affecting wetlands and floodplains.

Bighorn Canyon National Recreation Area is located mostly in a desert. On the rocky plateaus north of Horseshoe Bend, ground water has not been accessible except for a few calcareous springs where the water seeps out of the bottom of limestone cliffs. Most of the water used by settlers in this "Dryhead" area came from small streams off the nearby Pryor Mountains and a few springs and cisterns. The historic ranches and grazing areas are located near the few areas of wetlands and creeks in the park. None of the AML's are near these previously developed areas. The mineral exploration sites are all on arid plateaus well away from wetlands and rivers. The few sites near the canyon rim are still so far away from the Bighorn River that erosion and sediment deposition are not concerns, especially since the pattern of drainage on these sites is away from the rim. There should be no impact on water quality or stream flow characteristics. All of the sites are well away from the floodplains of the Bighorn and Shoshone Rivers as well as their tributary creeks.

Wildlife biologists working in the park have expressed concern that some of the old excavations may be functioning as water tanks for wildlife. Of the 351 sites mapped, only 8-10 showed evidence of previous standing water. These catchments are shallow and high in clay. Only 2 or 3 show hoof prints that suggest wildlife use and none show evidence of holding water beyond the periods when water is plentiful on the plateau areas after a rain. Repeated visits to the sites that hold water have shown these temporary ponds hold water for a few days only. They fit the Army Corps of Engineers definition of non-wetlands because they are seldom inundated, have xeric soils and support vegetation adapted for life only in aerobic soils.

Because of the lack of proximity of the AML's to the groundwater, surface water, floodplains and wetlands, water quality is excluded as a topic of discussion.

Recreation Area Operations

The targeted AML's are all located well away from areas of recreation area operations such as the historic ranches, marinas, concessions, visitor center and park service storage areas. The actual work on the AML's, including monitoring and follow-up will be done by resource management staff as part of their regular vegetative management duties. Since there will be no impact from the reclamation of targeted AML's, recreation area operations is excluded as a topic of discussion.

Historic Structures

Bighorn Canyon National Recreation Area has five historic ranches within its boundaries and four (the Mason-Lovell Ranch, Hillsboro, the Lockhart Ranch and the Ewing-Snell Ranch) are listed on the National Register of Historic Places. The National Historic Preservation Act, as amended in 1992(16 USC 470 *et seq*.); the National Environmental policy Act of 1969 (42 USC 4321 et seq.); and the National Park Service's Director's Order #28, *Cultural Resource Management Guideline* (1997) *Management Policies, 2001*(2000) and Director's order #12, *Conservation Planning, Environmental Impact Analysis, and Decision Making* (2001) require the consideration of impacts on historic structures listed in or eligible for listing in the National Register of Historic Places. The proposed action and the alternatives do not involve any disturbance of the historic ranch buildings or the surrounding cultural landscapes. Historic structures are dismissed as an impact topic of discussion.

Museum Collections

The National Park Service's *Management Policies, 2001*(2000) and Director's Order #28, *Cultural Resource Management Guideline* (1997) require the consideration of impacts on museum collections (historic artifacts, natural specimens, and archival and manuscript material. All of the museum collections are housed in the South District Visitor Center or the North District Administration Building. No aspect of the proposed action or the alternative is carried out in or near these buildings so museum collections were dismissed as an impact topic.

Prime and Unique Farmlands

In August, 1980, the Council on Environmental Quality (CEQ) directed that federal agencies must assess the effects of their

actions on farmland soil classified by the U.S. Department of Agriculture's Natural Resource conservation Service as prime or unique. Prime or unique farmland is defined as soil that particularly produces general crops such as common foods, forage, fiber and oil seed; unique farmland produces specialty crops such as fruits, vegetables and nuts. While there are abandoned farmlands associated with the all five historic ranches, the soil of these ranches is marginal for production and irrigation potential is limited by the paucity of water. At best these lands produced a single crop of mixed grass and alfalfa hay and they cannot be considered either prime or unique. There are no AML's on or near these abandoned fields. The arid, rocky plateaus where the AML's are located are totally unsuitable for agriculture. NCRS describes them as rangelands significantly impacted by grazing to where the vegetative composition and productivity are about 30% of potential. The proposed action and alternatives would result in neither the degradation nor the conversion of existing prime farmland to nonagricultural uses. Therefore, the topic of prime and unique farmlands was dismissed as an impact topic.

Air Quality

Section 118 of the Clean Air Act (42 USC 7401 *et seq*.) requires a park to meet all federal, state and local pollution standards. Bighorn Canyon National Recreation Area in designated as a Class II air quality area under the Clean Air Act as amended. A Class II area designation indicates the maximal allowable increases in concentrations of pollutants over baseline concentrations of sulfur dioxide and particulate matter as specified in Section 163 of the Clean Air Act. Furthermore, the Clean Air Act requires that the federal land manager have an affirmative responsibility to protect air quality related values (including visibility, plants, soils, water quality, cultural resources and visitor health) from adverse pollution impacts.

Digging up the AML's on dry windy days does involve the temporary suspension of dusts in the atmosphere. The dust generated is a very small amount and very localized and short-term. There is no affect on visibility, PM10, NOx, ozone, hydrocarbons or SO2. Overall there would be negligible degradation of air quality that would be local and temporary. Bighorn Canyon National Recreation Area's Class II air quality would not be affected by the proposal or its alternatives. Therefore, air quality was dismissed as an impact topic.

Soundscape Management

In Accordance with National Park Service *Management Policies* (2001) and Director's Order #47, *Sound Preservation and Noise Management*, an important part of the National Park Service

mission is preservation of natural soundscapes associated with national park units. Natural soundscapes exist in the absence of human caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in the parks. Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted through air, water or solid materials. The frequencies, magnitudes and durations of human-caused sound considered acceptable varies between National Park Service units, as well as potentially throughout each park unit, being generally greater in developed areas that undeveloped areas.

Bighorn Canyon National Recreation Area is known for its quiet, remote desert setting. On the plateaus above the canyon rims, the soundscape is one of silence, interrupted only by the wind, birds and bighorn sheep. There is noise from motorboats on Bighorn Lake, but the canyon is so deep that the boats are barely heard if one is on the canyon rim and not heard at all away from the rim. The components of the proposed action and alternatives tend to be very quiet activities. Use of motorized equipment is limited to the park road and developed areas already being used by cars, trucks and RV's. There would also be occasional use of motorized equipment on the AML's that are near the old mining roads. Any dissonant sounds would be short lived and confined to developed areas so soundscape management was dismissed as an impact topic.

Lightscape Management

In accordance with National Park Service *Management Policies 2000*(2001), the National Park Service strives to preserve natural ambient lightscapes, which are natural resources and values that exist in the absence of human caused light. Bighorn Canyon National Recreation Area has sources of human caused light only at two campgrounds and the Visitor Center. Since the proposed action and alternative involve no use of human caused light, lightscape management is dismissed as an impact topic.

Socioeconomic Environment

The proposed action or the alternatives would neither change local and regional land use nor appreciably impact local businesses or other agencies.

Most of the sites are in remote areas, so there is little socioeconomic impact on surrounding communities. The sites are well away from tribal lands and not used by the Crow for any purpose other than usual tourism. No agencies, concessions or

regional economies will be impacted. Therefor socioeconomic environment was dismissed as an impact topic.

Environmental Justice

According to the Environmental Protection Agency, environmental justice is the fair treatment and meaningful involvement of all people, regardless of race, color, national origin or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies. Fair treatment means that no group of people, including a racial, ethnic or socioeconomic group, should bear a disproportionate share of negative environmental consequences resulting from industrial, municipal and commercial operations or the execution of federal, state, local and tribal programs and policies.

Presidential Executive Order 12898 *"General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations",* requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing the disproportionate high and/or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. The nearby Bighorn Basin and town of Lovell are economically depressed with many low-income families. There are only scattered minorities. The proposed action and alternatives would not have health or environmental affects on minorities or low-income populations or communities as defined in the *Environmental Protection Agency's Draft Environmental Justice Guidance* (July 1996). The proposed action will improve the experience of using the park for all populations, regardless of race or income status. Therefore, environmental justice was dismissed as an impact topic.

ALTERNATIVES CONSIDERED

ALTERNATIVE A: NO ACTION-Leave the abandoned uranium exploration sites as they are.

There would be no actions to re-contour the AML's. The process of regeneration would continue by erosion and natural reseeding which in this desert environment is very slow. There would be no attempts to speed up the process of vegetative succession by planting native plants.

ALTERNATIVE B-Reclamation of the abandoned uranium exploration sites by a combination of re-contouring and seeding with native seed. (Preferred Alternative)

Each uranium exploration site has been photographed, documented by drawings and the botanic and hydrologic condition recorded. Each site was checked for proximity to cultural resources, noxious weeds, species of special concern, potential for impact on wetlands or water quality and potential for socioeconomic or visitor use impacts. All positive findings were recorded with the description of each site (See checklist Appendix E).

The mineral exploration sites were mostly created by DC6 caterpillars and consist of one to four foot deep grooves with two to six foot high mounds at one end. Re-contouring will consist of moving the dirt of the mounds back into the groove. Minimal dirt will be collected from the sides of the groove for filling the groove. The sites that are on the original mining two-track roads with easy backhoe access will be re-contoured to a contour that approximates the original contour as closely as possible. Those sites that do not have mining track access or are in sensitive areas such as high quality cushion plant communities or friable soil, will be re-contoured by hand using shovels and other hand equipment. At present a total of 153 sites representing 4.5 acres will be done by hand and 91 sites with a total of 10.4 acres will be done by appropriate heavy equipment.

Before re-contouring, each site will be rechecked for plant species of concern, noxious weeds and archeological artifacts. The entire access route will be walked again to assess for cultural features and plant species of concern and the route or method of re-contouring changed to accommodate new findings. After a natural appearing contour has been achieved, each site will be seeded with native grass and shrub seeds of the species found near the sites. The seeds are from a native seed nursery located in the Bighorn Basin and are certified weed free. Collection of seeds from near the sites is not an option because of the inconsistent production of viable seed in this desert climate. Soil amendments such as soil lock and mulch will be used as appropriate to the site. For further increase of the boundary layer in this high wind environment, each site will covered with dead juniper and sagebrush collected from near the site. The dead wood would be taken off the sites after three to five years. On the Pryor Mountain Wild Horse Range, the dead wood serves the additional purpose of discouraging trampling and grazing. Each

site will be monitored for noxious weeds and treated as indicated.

There is one large 5.6 acre site (Y28) that is an area where the top soil was scraped off leaving a rim of rocky rubble and a large flat area of subsoil that 30-40 years later still grows only halogeton, broom snakeweed and a few sagebrush. The access road to this site is still usable but it has been partially revegetated. Because of the very poor nature of the soil of this site, considerable soil amendments will be needed. The plan is to add up to 2 tons/acre of well composted cow manure and work it in. The rocky rim material will be spread over the site by backhoe. The site would then be drill seeded with native grasses, shrubs and forbs and certified straw mulch disked in. The access road would sustain considerable compaction since heavy equipment would be needed for bringing in materials, working them in and drill seeding. The access road would also need cultivation and seeding after the 5.6-acre site was planted. This seeded area would need fencing to protect the grasses from heavy grazing from wild ponies until the grasses were established. (Fencing is not planned for the smaller sites.) Since certified straw and composted organic matter would be used, the potential for further weed colonization is low. Control of the weeds currently on the site would be needed until the grasses and shrubs are well established. There would be a temporary disturbance of the old access road into the site but since it has responded well to ripping and seeding in the past, there should be a good response to cultivation and seeding after the large excavation has been reseeded.

Soil analysis would be done on the larger sites and some representative soils in the smaller sites after re-contouring. The selection of soil amendments like fertilizer and additional organic matter would be guided by the results of the soil analysis. Generally, native desert plants have the best competitive advantage in soils that are relatively low in nutrients.

Some of the uranium exploration sites on Barry’s Island are in old, depauperate Juniperus osteosperma stands on highly erodible Chugwater soil. To improve access and increase potential for revegetation with grasses and shrubs, selected juniper trees will be cut, dismembered and spread over the sites after they have been re-contoured and seeded. Research in similar old stands has shown that this

results in good increases in forage with minimal weed invasion when compared with other alternatives such as prescribed fire, chaining or no action.

OTHER ALTERNATIVES CONSIDERED BUT REJECTED

Alternative C- Limit any potential damage to artifacts and plants on the access routes to the uranium exploration sites by doing all re-contouring by hand. However this alternative is extremely labor intensive. A large pit and mound complex that would take a backhoe two days to re-contour would take a six-man crew 4-6 weeks. The labor is very heavy and difficult to sustain, especially in the heat of the summer when seasonal labor crews are available. This alternative is so expensive and difficult that the reclamation would never be done under current labor availability. Generally if an excavation was done with machinery, re-contouring must also be done with machinery to restore a more normal hydrology unless the excavation is small.

Alternative D- Re-contour the sites with the mixture of backhoe and hand labor but not reseed with locally purchased native seed to avoid a potential source of weed introduction and insure that all plants that colonize the site are from sources immediately around the site. Many of these sites are small enough for such colonization. However, this process is slow and the longer a recently disturbed site remains unvegetated, the higher the risk for colonization with noxious weeds like cheatgrass, houndstongue and Canada thistle. Experience with the local source of certified native seed from a local grower, indicates that the risk of noxious weeds is minimal and the plants that grow are phenotypically the same as the plants grown from seed in the immediate area. The vegetation of Bighorn Canyon has already been impacted by 80 to 120 years of grazing and can in no way be considered a pristine environment.

Alternative E- Do not re-contour the excavations but plant seed on them as they currently are to cover them with vegetation. These sites are hydrologically impaired with areas of occluded drainage and thin impermeable soil in the pits. The mounds have steep surfaces where the water drains off rapidly and the slope increases the effect of sun. Because of these conditions, there has been little revegetation over the past 45 years in spite of access to

local seed. Recent experience with re-contouring these sites show that as soon as the pit and mound are smoothed out, native seeds grow and there is an immediate increase in the rate of colonization from nearby seed sources. Also the mounds in Middle Pasture that show a good growth of native plants because of higher rainfall and better soils still have a very unnatural appearance because the disturbed contour persists. The single most important step in reclamation of these sites appears to be the re-contouring.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

The environmentally preferred alternative is determined by applying the criteria suggested in the National Environmental Policy Act of 1969 (NEPA), which is guided by the Council on Environmental Quality (CEQ). The CEQ provides direction that "[t]he environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA's Section 101...:"

- fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- assure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings;
- attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
- preserve important historic, cultural and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
- achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and
- enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

Alternative B, the preferred alternative, is the environmentally preferred alternative. Implementing the plan for reclamation of the abandoned uranium exploration

sites would give the maximum protection of the natural and cultural resources of Bighorn Canyon National Recreation Area with the least possible risk to human and environmental health and safety. Reclamation of these AML's will integrate resource protection with opportunities for and appropriate range of visitor uses, which preserves important historic, cultural and natural aspects of our national heritage.

Alternative A (No Action) is not the environmentally preferred alternative. The continuing presence of the unreclaimed AML's represents a continuing safety risk if used inappropriately by visitors. The multiple disturbances from mineral exploration are esthetically distracting and may result in an inappropriate visitor interpretation of the landscape. The disturbances of the old AML's result in the loss of about 15 acres of wildlife forage, continuing soil erosion and increased potential for colonization by alien plant species. Alternative A does not integrate protection with opportunities for and appropriate range of visitor uses, which preserves important historic, cultural and natural aspects of our national heritage.

MITIGATION MEASURES OF THE PREFERRED ALTERNATIVE

Because the soils of Bighorn Canyon National Recreation Area are high in clays, they are very susceptible to compaction when wet. When dry, they are more resistant to disturbance by trampling or soft wheels. All re-contouring of the AML's will be done when the soil is dry to avoid compaction, loss of soil structure and unsightly marking of the landscape with tire tracks. Seeding will also be done only when the soil is dry to avoid clumping of the seed.

If during reclamation of the AML's, previously unknown archeological resources are discovered, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and an appropriate mitigation strategy developed, if necessary, in consultation with the Montana or Wyoming State Historic Preservation Office. In the unlikely event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (25 USC 3001) of 1990 would be followed.

Fencing will be done around the one large (5.6 acre) site on the Pryor Mountain Wild Horse Range to prevent trampling and grazing on a site that it too large to protect with dead wood.

Before reclamation, each cluster of sites and the access routes will be resurveyed for cultural resources and plant or animal species of concern. The access route or method of re-contouring would be changed to protect these resources. The specialist doing the resurvey would be out working with the people doing the re-contouring to assure that the targeted resources are identified and protected.

Table 1. Extent that Each Alternative Meets Objectives.

Objectives	Does Alternative A: No Action Meet Objective?	Does Alternative B: Proposed Action Meet Objective?
Restore as natural appearing contour as possible to uranium exploration pits.	No (-) The highly disturbed profile of the pit and mound structure of the exploration sites would remain unchanged.	Yes (+) There would be an immediate improvement in the contour of the exploration pits with improved hydrology and esthetic appearance.
Restore the native vegetation to the uranium exploration	No (-) Vegetation would remain sparse to	Yes (+) There would be an increase in native

Objectives	Does Alternative A: No Action Meet Objective?	Does Alternative B: Proposed Action Meet Objective?
pits.	absent because of the impaired hydrology of the pit and mound structures.	vegetation related to seeding and improved site characteristics for vegetative growth.
Do minimal collateral damage to park natural and cultural resources to prevent impairment of park resources and values.	Yes (+) There would be would be no additional disturbance so there would be no additional impairment of park resources and values.	Yes (+) Mitigation measures would result in no impairment of park resources and values. Any adverse effects would be minor and short-term.

Table 2. Comparative Summary of Alternatives.

Actions	Alternative A: No Action	Alternative B: Proposed Action

Actions	Alternative A: No Action	Alternative B: Proposed Action
Access	Access to the AML's would not be needed.	Where intact mining roads exist, access to the AML's would be along the mining road. Where there no road or the AML's have sensitive aspects, access would by hiking in. In one area, old juniper would be thinned to allow backhoe access.
Method of Re-contouring	Slow erosion for hundreds of years.	A backhoe would be used on most of the AML's near the mining roads. For sites away from the mining roads or near sensitive cultural and natural resources, re-contouring would be done by hand.
Revegetation	Natural revegetation would proceed very slowly because of the arid climate and the additional water stress caused by the pit and mound structure of the AML's	Native seed of the same species as those of the nearby area would be broadcast seeded and raked into the re-contoured surface.
Soil Amendments	None would be needed since there would be no reclamation.	Depending upon the soil characteristics of the AML sites, soil amendments such as mulch, fertilizer and compost would be used.

Table 3. Comparative Summary of Impacts.

Impact Topic	Alternative A: No Action	Alternative B: Proposed Action
Soils	There would be continuing erosion on the AML's located on friable soils. Other wise there would be no direct or indirect impacts on soils since there would be no additional disturbance.	There would be potential for minor and short-term compaction of the soil with re-contouring.
Biotic Communities	There would be minor long-term impacts on biotic communities because of the continuing loss of about 15 acres of forage and fragmentation of plant communities	There would be minor short-term impacts on biotic communities from trampling and early successional weeds
T&E Species and Species of Special Concern	There would be no impacts since there would be no actions.	Impacts would be minor and short-term, affecting only a few individuals of species of special concern.
Archeological Resources	There would be no impact since there would be no action.	Impacts on Archeological resources would be negligible if planned mitigation measures are done.
Visual Resources and Topography	The topography of the areas where the AML's are located would continue to appear highly disturbed. These changes would be localized and would vary from moderate to major depending upon the AML cluster and would be long-term.	There would be an immediate improvement in the visual appearance and topography once the AML's are re-contoured. Revegetation with native plants would further improve the AML's towards a natural appearance. This improvement would be moderate to major depending upon the degree and density of disturbance and long-term.
Visitor use and Experience	Under Alternative A, there would continue to be a minor safety risk form inappropriate use of the AML's. The quality of the visitor experience for those using the old mining roads as trails would be moderately decreased. These impacts would be long-term.	Under Alternative B, there would be a very short-term and local limitation of visitor use to some trails. Once the AML's are re-contoured and seeded, there would be an immediate improvement in visitor safety and enjoyment of the esthetic aspects of the old mining roads used as trails.

AFFECTED ENVIRONMENT

The uranium exploration sites are located in scattered clusters through out the South District of Bighorn Canyon NRA between Crooked Creek and the North Pasture (See Appendix C). The sites tend to be located in limestone areas of the Madison and Amsden Formations with some on the junctions with the Chugwater Formation or the pink clays of the Embar Formation. The previous bulldozer access to these sites usually comes off the former Bad Pass Road. The AML sites are all well off the main road and current access is by foot though many of the old mining roads are intact enough to easily be used by a four wheel drive vehicle or backhoe when the soil is dry. In some areas, the two-track access has been nearly erased by normal weathering and revegetation. In other areas, especially on the pink clays and red siltstones, the access tracks are very visible and eroding. Some of the mining access two track roads are eroding paths to nowhere and would be revegetated as part of the reclamation of the cluster accessed by that mining road. Other mining two track roads have good potential or are currently being used as trails. These roads will not be affected by this action other than the one time access by backhoe. A geologist from the Geological Resources Division of the National Park Service did Geiger counter readings for radiation on some of the deeper sites in 1991. None of the AML's showed a reading above 0.1 mRems/hr. The maximum allowed exposure for a non-worker is 0.5 Rem/yr, which would take 5,000 hours of exposure to reach.

The first work on these AML's was done 1983. A total of 29 sites in areas highly visible to the public were re-contoured with either a rubber-tired backhoe or by hand. The sites were seeded with native seed from a local seed nursery. Native shrubs were also planted on some sites with water catchment pits around them. Each site was photographed before and after re-contouring. The location was described but no GIS layer or map was done. There was no measurement of size, but each site was small. Ten years later each site was re-photographed and site conditions recorded. Location and mapping of additional AML's was done in 1990-1991. In 1999, these sites were relocated and mapped with GPS unit. A total of 351 sites covering 17.8 acres was mapped. A checklist was used for each site and access to assess for potential for adverse effects on the natural and cultural landscapes (see Appendix E). There was a photograph of each site as well as a drawing showing size, orientation and other significant characteristics. A reclamation plan was developed for each site and priority for reclamation determined. At the time of the 1999 mapping, reclamation of these AML's fit the criteria for categorical exclusion so reclamation was started in 2000, before DO #12. Between 2000-2002 a total of 107 AML's were reclaimed. Fifty-one (1.2 acres) were done with hand tools and 56 (1.6

acres) were done with a rubber-tired backhoe. All of the AML's re-contoured in 2002 were small sites in remote areas that were done by hand. Of the 351 sites mapped, 153 sites (4.5 acres) remain to be done by hand and 91 sites (10.4 acres) remain to be done by backhoe. The sites reclaimed in 2000 were rechecked in 2002 and the results from the reclamation project in 1983 reviewed. The results from these early efforts showed that with hand re-contouring, there is approximately a 10% increase in the size of the disturbed ground surface. With re-contouring with backhoe, the increase in size is about 20%. If the ground is dry and the soil rocky, the tracks made by the rubber tires between the mining road and the targeted AML are shallow and erased by several good rains. There is an immediate improvement in the appearance of the sites after reclamation. Noxious weeds were not found and the process of the return to native vegetation was speeded up by reclamation.

Soils

Bighorn Canyon National Recreation Area has variable soils in the affected areas that include skeletal aridosols, (desert soils) entisols (young soils) and high clay vertisols (unstable clay soils that swell and shrink). The skeletal soils located on the rocky plateaus are resistant to damage from compression from heavy machinery, especially when dry. The pink clay soils and silty Chugwater Formation soils compress easily, especially if damp. If dry, they are friable and use of heavy machinery may leave visible marks that take years to erase naturally.

Biotic Communities

The vegetation of the affected area is a mosaic of basin grasslands, windswept plateau, Juniperus osteosperma woodlands and mixed mountain mahogany woodlands. These communities have a high proportion of forbs and small shrubs relative to the grasses and tend to be sparse. They are adapted to the high wind, extremes of temperature, low precipitation, periods of drought and thin soils of the areas around the excavation sites. Many of the juniper woodlands are old and show evidence of depletion of the nutrients and plants in the understory, especially those on the red soils derived from the Chugwater Formation.

These rocky plateaus are utilized by a variety of mammals including Rocky Mountain bighorn sheep, mule deer, the Pryor Mountain wild horses, rabbits and assorted rodents. There are a few reptiles (e.g. rattlesnakes and sagebrush lizards) and birds (e.g. mountain bluebirds and pinon jays) that live in the plateau woodlands. None of these animals are on the threatened & endangered list. Generally wildlife is sparse on the areas where the AML's occur because of the aridity, lack of consistent surface water and the results of long-term overgrazing.

Threatened and Endangered Species and Species of Special Concern

Potential Federal and State listed Threatened and Endangered Species in the Bighorn Canyon area include: bald eagle, Canada lynx, and black footed ferret. Of these, only the bald eagle is found in Bighorn Canyon National Recreation area as well as the recently de-listed peregrine falcon. The habitat is unsuitable for the other listed species and they have not been seen in Bighorn Canyon National Recreation Area. Potential animals on the species of special concern and candidate species list include leopard frog, milk snake, sturgeon chub, mountain plover, sharptail grouse, northern goshawk, black-tailed prairie dog, Townsend's big-eared bat, swift fox, Merriman's shrew, long–eared myotis, hoary bat and spotted bat (see Appendix F). While there are no known plants on the T&E list in Bighorn Canyon NRA, there are four plant species of concern in the state of Montana found on the rocky plateaus where the mineral sites are located They include: Erigeron allocotus, Stanleya tomentosa, Astragalus oreganus and Eriogonum brevicaule var.canum.

Archeological Resources

Native Americans have used the area of Bighorn Canyon for over 10,000 years as a trail between the Great Plains and the Bighorn Basin and as a hunting ground. The most visible evidence of this use is the Bad Pass Trail where a series of large rock cairns mark the passage of people migrating between the Great Plains and the Bighorn Basin. Other archeological features include buffalo jumps, vision quest sites, flaking sites, teepee rings, wood storage structures and siege sites. The Bad Pass Trail and the Pretty Creek Archeological Site are on the National Register of Historic sites. Before the Yellowtail Dam was built (1965) and in the 1970's, extensive surveys of the archeological sites were conducted and the results digitized for GIS. There are a total of 186 archeological sites in Bighorn Canyon National Recreation Area listed in the National Park Service Archeological Sites Information Management System (ASMIS). Of these 141 are in the South District above the canyon rim, not counting the cairns of the Bad Pass Trail. The sites are clustered along riparian areas, rock cliffs and flat meadows.

Topographic and Visual Resources

Bighorn Canyon National Recreation Area is located at the northern end of the Big Horn Basin between the Bighorn and Pryor Mountains. The Bighorn River was a meandering stream that was uplifted about 10 million years ago to form a deep canyon with entrenched meanders. The area is rich with visual and geological resources. The rock strata range from Cambrian Gros Ventre shales to Cretaceous shales and sandstones exposed by faulting,

uplifting and erosion. These exposed strata comprise a veritable geological textbook showing 530 million years history of the area as well as demonstrating the forces of erosion, faulting, folding, deposition and regional uplift.

Visitor Use and Experience

When Bighorn Canyon National Recreation Area was created in 1966, the main recreational emphasis was on water based recreational use of the Bighorn Lake. As siltation reduces the potential for water-based activity in the southern part of the park, a need for increased land based recreational opportunities is recognized based upon visitors requests for information on hiking. The old mining roads show excellent potential as visitor use trails. The ones that are already marked as trails are showing evidence of use.

ENVIRONMENTAL CONSEQUENCES

METHODOLOGY

Potential impacts are described in terms of type (are the effects beneficial or adverse?), context (are the effects site-specific, local, or even regional?), duration (are the effects short-term, lasting less than one year, or long-term, lasting more than one year?), and intensity (are the effects negligible, minor, moderate, or major, or would the effects constitute impairment of the monument's resources and values?).

In addition, National Park Service's *Management Policies, 2001* (2000) require analysis of potential effects to determine whether or not actions would impair park resources. The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. National Park Service managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adversely impacting park resources and values. However, the laws do give the National Park Service the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the National Park Service the management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement that the National Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values. An impact to any park resource or value may constitute

impairment, but an impact would be more likely to constitute impairment to the extent that it has a major or severe adverse effect upon a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park; or
- identified as a goal in the park's general management plan or other relevant NPS planning documents.

Impairment may result from National Park Service activities in managing the park, visitor activities, or activities undertaken by concessionaires, contractors, and others operating in the park. A determination on impairment is made in the *Environmental Consequences* section for soils, biotic communities, T and E species, archeological resources, visual resources and topography and visitor use and experience.

CUMULATIVE IMPACT SCENARIO

The Council on Environmental Quality (CEQ) regulations, which implement the National Environmental Policy Act of 1969 (42 USC 4321 et seq.), require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts are considered for both the no-action and preferred alternatives.

Cumulative impacts were determined by combining the impacts of the preferred alternative (Alternative B) with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future actions at Bighorn Canyon National Recreation Area and, if applicable, the surrounding region. Previous similar projects include the 1983 reclamation of 29 AML's, reclamation of desert campgrounds at Horseshoe Bend loop B (1998) and Kane (1999) and reclamation of a Butyl Bag west of the Lockhart Ranch. Future similar projects include reclamation of loop C at Horseshoe Bend and a butyl bag north of the Lockhart Ranch. The results of the previous reclamation projects were considered as well as the spatial arrangement and possible interactions of the projects. Cumulative impacts of No Action were determined by looking at the lack of natural re-contouring and revegetation of the AML's in the 40 years since they were abandoned and the changes since photo documentation of most of these sites in 1983,1991 and 1993.

IMPACTS TO CULTURAL RESOURCES AND §106 OF THE NATIONAL HISTORIC PRESERVATION ACT

In this environmental assessment/assessment of effect, impacts to cultural resources are described in terms of type, context, duration, and intensity, which is consistent with the regulations of the Council on Environmental Quality (CEQ) that implement the National Environmental Policy Act (NEPA). These impact analyses are intended, however, to comply with the requirements of both NEPA and §106 of the National Historic Preservation Act (NHPA). In accordance with the Advisory Council on Historic Preservation's regulations implementing §106 of the NHPA (36 CFR Part 800, *Protection of Historic Properties*), impacts to archeological resources and the cultural landscape were identified and evaluated by (1) determining the area of potential effects; (2) identifying cultural resources present in the area of potential effects that were either listed in or eligible to be listed in the National Register of Historic Places; (3) applying the criteria of adverse effect to affected cultural resources either listed in or eligible to be listed in the National Register; and (4) considering ways to avoid, minimize or mitigate adverse effects.

Under the Advisory Council's regulations a determination of either adverse effect or no adverse effect must also be made for affected National Register eligible cultural resources. An adverse effect occurs whenever an impact alters, directly or indirectly, any characteristic of a cultural resource that qualify it for inclusion in the National Register (e.g. diminishing the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association). Adverse effects also include reasonably foreseeable effects caused by the preferred alternative that would occur later in time, be farther removed in distance or be cumulative (36 CFR Part 800.5, *Assessment of Adverse Effects*). A determination of no adverse effect means there is an effect, but the effect would not diminish in any way the characteristics of the cultural resource that qualify it for inclusion in the National Register.

CEQ regulations and the National Park Service's *Conservation Planning, Environmental Impact Analysis and Decision-making* (Director's Order #12) also call for a discussion of the appropriateness of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, e.g. reducing the intensity of an impact from major to moderate or minor. Any resultant reduction in intensity of impact due to mitigation, however, is an estimate of the effectiveness of mitigation under NEPA only. It does not suggest that the level of effect as defined by §106 is similarly reduced. Although adverse effects under §106 may be mitigated, the effect remains adverse.

RESOURCE TOPIC 1- SOILS

METHODOLOGY

The soil maps of the National Recreation Area were reviewed and correlated with the observations of soil types where the AML's were located. Over a period of four years the type of vegetation related to soil type was observed. Other observations included the potential for weed infestation, the water infiltration and water holding potential, the response to compaction, the erodibility and ease of growing native vegetation in an arid climate. For purposes of analyzing impacts to soil resources, the thresholds of change for intensity of impact are:

Negligible: Soils would not be affected or the effects to soils would be below or at the lower levels of detection. Any effects to soil productivity or fertility would be slight and no long-term effects to soils would occur.

Minor: The effects to soils would be detectable. Effects to soil productivity or fertility would be small, as would the area affected. If mitigation were needed to offset adverse effects, it would be relatively simple to implement and would likely be successful.

Moderate: The effect on soil productivity or fertility would be readily apparent, likely long-term, and result in a change to the soil character over a relatively wide area. Mitigation measures would probably be necessary to offset adverse effects and would likely be successful

Major: The effect on soil productivity or fertility would be readily apparent, long-term, and substantially change the character of the soils over a large area in and out of the monument. Mitigation measures to offset adverse effects would be needed, extensive, and their success could not be guaranteed

REGULATIONS AND POLICIES

Current laws and policies require that the following conditions be achieved in the park:

Desired Condition	Source
Prevent unnatural erosion	National Park Service's Management Policies 2001 (2000)

Avoid physical removal

Avoid contamination of the soil

IMPACTS OF ALTERNATIVE A-NO ACTION

Impact Analysis

Erosion will continue on the friable soils of the Chugwater Formation and the excavation sites high in clay. Comparison photos in 1991 and 2000 show increase in size of some of these highly erodible sites over 10 years.

There would be a moderate direct impact on soils. The continuing erosion would be readily apparent. It would usually be limited in area but in the large dense clusters of AML's at Barry's Island, Devil Canyon Overlook and South Layout Creek would gradually result in change over a relatively large area. The erosion would continue long-term. There would be a minor indirect effect of changes related to the effect of reduced vegetation upon soil structure.

Cumulative Effects

Over time, the continuing erosion on the larger sites located on clay or Chugwater Formation derived silt could result in coalescing areas of bare eroded soil.

Conclusion

There would be a minor to moderate direct impact on soils that will be long-term. There is potential for minor adverse indirect and cumulative effects.

Because there would be no major adverse impacts to a resource whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of Bighorn Canyon National Recreation Area; (2) key to the natural or cultural integrity of the recreation area; or (3) identified as a goal in the recreation area's general management plan or other relevant National Park Service planning documents, Alternative A would result in no impairment of the recreation area's resources and values.

IMPACTS OF ALTERNATIVE B-PREFERRED ALTERNATIVE

Impact Analysis

Revegetation of the uranium exploration pits and mining access roads will in the long run reduce the amount of erosion. In highly erodible soils, amendments such as @Soil Lock will reduce the risk of erosion. Mechanical thinning of the dense juniper stands to allow access was selected to reduce erosion as well as create microclimates more conducive to plant growth. Research in similar stands in arid climates has shown that thinning, chopping up and spreading Juniperus osteosperma branches results in better growth of native vegetation than chaining or fire with less disturbance of the soil and less weed invasion.

Direct Impacts-The backhoe may cause soil compression and long lived tire marks in friable or wet soils. The risk is higher with use of the backhoe but previous work with re-contouring these sites shows that if the soils are rocky and the ground is dry, the damage is minimal. Under these conditions, soil compression is minimal and the tire marks are erased after a few good rains. There would be negligible adverse impacts with hand re-contouring the smaller, more sensitive sites. With the backhoe, the perimeter of the disturbed site is increased by about 20% as compared to 10 % when the human crews are used. There may be a temporary increase in erosion from loosening the soil but reducing the height of the mound to surface level would mitigate against this. The adverse direct impacts would be minor and short-term. There would be an immediate moderate beneficial effect on the soil from improved drainage patterns, better aeration and improved fertility where fertilizers and mulches are added.

Indirect Impacts- There would be negligible adverse indirect impacts with minor beneficial direct impacts from improving soil structure as native plants increase on the sites.

Cumulative Effects

None expected since this is a one time event for each cluster of mining sites with no further intervention except for monitoring and some hand weeding.

Conclusion

There would be minor adverse direct and indirect effects on soils. There would be moderate beneficial effects of soils from the preferred action. There would be no cumulative impacts.

Because there would be no major adverse impacts to a resource whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of Bighorn Canyon National Recreation Area; (2) key to the natural or cultural integrity of the recreation area; or (3) identified as a goal in the recreation area's general management plan or other relevant National Park Service planning documents, Alternative B would

result in no impairment of the recreation area's resources and values.

RESOURCE TOPIC 2- BIOTIC COMMUNITIES

METHODOLOGY

Bighorn Canyon National Recreation Area has some very unique plant communities especially the cushion plant communities of the basin grasslands and windswept plateaus. In these arid, windy environments, the plants show the same adaptations as the plants in alpine areas above timberline. Even plant species that are tall and bushy in less difficult environments, become small and rounded in response to the low moisture and high wind. Four of the plant species of special concern in the state of Montana are endemic to these communities. These areas were identified using the maps and definitions from Knight's Vegetation Ecology of Bighorn Canyon National Recreation Area. The presence of noxious and other alien plants was determined at the time of the initial survey of the AML's. The potential for weed infestation after reclamation was estimated from looking at the proximity of weeds to the AML's and the results from the 1983 and 2000-2001 AML reclamation efforts.

Other communities that are of concern are the neotropical birds that use the upland plateaus for nesting. The initial survey data was reviewed as well as three years worth of Audubon Club records from Bighorn Canyon National Recreation Area and staff observations of the bird life. The Bighorn sheep also use the area where the AML's were located. Their response to activity in the areas of the AML's was determined by asking the USGS researchers working on the sheep populations and the observed response to visitors and GPS mappers.

For purposes of analyzing impacts to biotic communities, the thresholds of change for intensity of impact are:

Negligible: Biotic communities would not be affected or the effects would be at or below the level of detection, would be short-term, and the changes would be so slight that they would not be of any measurable or perceptible consequence to plant or wildlife species' populations and interactions.

Minor: Effects to biotic communities would be detectable, although the effects would be localized, and would be small and of little consequence to the plant or wildlife species' populations and interactions. Mitigation measures, if needed to offset adverse effects, would be simple and successful

Moderate: Effects to biotic communities would be readily detectable, long-term and localized, with consequences at the population and community structure level. Mitigation measures, if

needed to offset adverse effects, would be extensive and likely successful.

Major: Effects to biotic communities would be obvious, long-term, and would have substantial consequences to plant and wildlife populations in the region as well as community interactions. Extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed.

REGULATIONS AND POLICIES

Current laws and policies require that the following conditions be achieved in the park:

Desired Condition	Source
Populations of native plant and animal species function in a natural condition as possible	National Park Service's Management Policies 2001(2000
Management of populations of exotic plant species will be undertaken when such species threaten park natural resources and and control is prudent and feasible	National Park Service's Management Policies 2001 (2000) Executive Order 13112 Invasive Species

IMPACTS OF ALTERNATIVE A-NO ACTION

Impact Analysis

There would be no direct impact on the plant communities or species of special concern since there would be no additional incursion into these plateau areas. There would be a minor indirect potential impact to these communities in some areas because of the fragmentation and potential for exotic plant invasion. The process of succession would continue to be very slow because of the impaired hydrology of the mound and pit structure of these exploration sites.

There would be no direct or indirect impact on wildlife from human activity in their habitat. Grazers would have the minor indirect impact of continuing loss of forage from 15 acres of

disturbed that is not regenerating to a normal cover of native vegetation.

Cumulative Effects

There would be a minor, long-term effect on wildlife populations from the loss of forage due to the slow speed of natural regeneration.

Conclusion

There would be minor adverse indirect and cumulative effects on biotic communities that would be long-term. Because there would be no major adverse impacts to a resource whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of Bighorn Canyon National Recreation Area; (2) key to the natural or cultural integrity of the recreation area; or (3) identified as a goal in the recreation area's general management plan or other relevant National Park Service planning documents, Alternative A would result in no impairment of the recreation area's resources and values.

IMPACTS OF ALTERNATIVE B- PREFERRED ALTERNATIVE

Impact Analysis

There is some potential for adverse effect in the unique cushion plant communities of the windswept plateaus. Most of the AML's in the cushion plant areas are small and away from the mining roads so they would be re-contoured by hand resulting in minor damage to the vegetation of these areas. There are a few larger AML's in cushion plant communities that will need re-contouring by backhoe. Since the rocky soil of these areas is quite resistant to damage when dry, the damage to cushion plant communities in these areas would be moderate but localized to a few small areas. Previous work in similar areas from 1983 shows good recovery after backhoe disturbance for reclamation in ten years.

Since the reclamation of mineral sites involves disturbance and seeding with seeds from a source other the immediate area, introduction of non-native plant species is a potential risk. The sites are currently free of alien and noxious weeds. The experience with the reclamation of these remote mineral sites using certified weed free seed in 1999 and 2000 is that colonization with noxious weeds has not been a problem but there are some early successional alien plants such as Russian thistle and alien mustards. Experience with reclaiming abandoned campgrounds under similar climate and soil conditions has shown that these early sucessional plants do not compete well with the native grasses and shrubs in the absence of ongoing disturbance. However, all reclaimed sites will be monitored until the native

plant density per site is >70% of the density of the surrounding vegetation. At this point, the potential for weed invasion is very low. Certified weed free seed will continue to be used.

The juniper woodlands and sagebrush steppe near many of the sites have potential use by neotropical migrants such as mountain bluebirds and Brewer's sparrows during nesting season though most of the nesting occurs along the riparian corridors well away from the AML's. Since all re-contouring work and seeding is done after the first part of July, potential for disturbance during nesting is minimal.

During lambing, the Bighorn sheep stay more in the canyon and are rarely found on the rocky plateaus above the canyon where the AML's are located. Once the lambs are mobile, the bighorn sheep show little response to human activities other than slowly moving away.

Direct Impacts- There would be negligible direct impacts upon neotropical birds and bighorn sheep activities. There would be minor to moderate direct impacts on cushion plant communities but these changes would be very local and reversed in less than 10 years if the mitigation measures of the preferred alternative are used.

Indirect Impacts-For sites on the Pryor Mountain Wild Horse Range, grazing of the young native grasses would slow down the rate of native revegetation after reclamation. There could be clustering of the wild horses around some of these AML's with additional damage to surrounding areas. Sites in cushion plants communities on the wild horse range that were reclaimed in 2000 and covered with brush and dead woodshow no evidence of increased trampling of the nearby vegetation and minimal use of the vegetation on the reclaimed AML's. Indirect impacts would be minor.

Cumulative Effects

As the number of reclaimed sites increases, there would be an increase in acres covered with native vegetation that can be used for the grazers of the biotic communities. Fragmentation of plant communities would improve in the dense clusters of AML's. Overall the cumulative impacts would be of minor benefit but long-term.

Conclusion

There would be minor adverse direct and indirect effects on biotic communities that are short-term. Cumulative impacts would be of minor benefit but long-term.

Because there would be no major adverse impacts to a resource whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of Bighorn Canyon National Recreation Area; (2) key to the natural or cultural integrity of the recreation area; or (3) identified as a goal in the recreation area's general management plan or other relevant National Park Service planning documents, Alternative B would result in no impairment of the recreation area's resources and values.

RESOURCE TOPIC 3- THREATENED AND ENDANGERED SPECIES

METHODOLOGY

National Endangered Species Act Reform Coalition, the Wyoming Natural Diversity Database and Montana Natural Heritage Program were contacted via the internet to generate a list of threatened, endangered and "species of special concern" for Bighorn County, Wyoming and Carbon County, Montana (see Appendix F). Phone consultation was obtained from the wildlife specialists of Montana Parks and Wildlife and Wyoming Game and Fish. The Montana and Wyoming State Offices for the US Fish and Wildlife Service were also contacted by phone with a description of the projects. A follow-up letter was sent (May 21, 2003) and the recommendations incorporated into the EA. The list was compared with the draft National Park Species database for Bighorn Canyon National Recreation Area, Wyoming G&F Biological Services data base, the U.S. Fish and Wildlife Service database in Billings, Mont. and the results of ongoing surveys for small mammals and reptiles and amphibians that are being carried out as part of the NPS inventory and monitoring process. The plants on the Natural Heritage Data Management System lists were compared with the lists generated by Heidel and Fertig which is the most current documentation of the areas flora. It includes status and location as well as habitat of the plant species of special concern. The park's records concerning locations of peregrine aeries and bald eagle nesting sites was compared with the current locations of AML's. The Audubon bird count records were consulted since they contain the most current sightings.

The only threatened or endangered species identified as being in the park was the bald eagle. Other animals on the T&E lists have not been seen in or near Bighorn Canyon National Recreation Area nor are there suitable habitat for them (See Appendix F). Theoretically the mountain plover can migrate through Bighorn Canyon National Recreation Area even there is no suitable habitat. Review of all park records showed one sighting in grasslands of the North District of Bighorn Canyon National Recreation Area during migration in 1985. Query of the Wyoming Game and Fish Biological Services and U.S. Fish and Wildlife Service databases showed no recorded sightings in the area where the AML's are located. The potential impacts on the recently

delisted peregrine falcon were also considered since the walls of the Bighorn Canyon are peregrine falcon habitat. The bats are found in the Pryor Mountains and cave areas well away from the AML's. The leopard frogs and milk snakes were found in moister areas than the arid plateaus where the AML's are located. There were six plants listed as species of special concern in Montana and/or Wyoming. Four of them: Erigeron allocotus, Stanleya tomentosa, Astragalus oreganus and Eriogonum brevicaule var. canum are endemic to the cushion plant communities found around some of the AML's. The initial survey of the AML's included a search for these four species.

For purposes of analyzing impacts to T&E species and species of concern biotic communities, the thresholds of change for intensity of impact are:

Negligible: No federally listed or state listed species would be affected. If the alternative would affect an individual of a listed species or its critical habitat, the change would be so small that it would not be of any measurable or perceptible consequence to the protected individual or its population. Negligible effect would equate with a "no effect" determination by the U.S. fish and wildlife service.

Minor: The effect on an individual(s) of a listed species or its critical habitat may be seen but the change would be small. Minor effect would equate with a "may effect" determination in U.S. Fish and Wildlife Service terms and would be accompanied by a statement of "likely…" or "not likely to adversely affect" the species

Moderate: The effect on an individual or population of a listed species, or its critical habitat would be noticeable. The effect could have some long-term consequence to the individual, population, or habitat. Moderate effect would equate with a "may effect" determination in U.S. Fish and Wildlife Service terms and would be accompanied by a statement of "likely…" or "not likely to adversely affect" the species

Major: The effect on an individual or population of a listed species, or its critical habitat, would be noticeably affected with a long-term, vital consequence to the individual, population, or habitat. Major effect would equate with a "may effect" determination in U.S. Fish and Wildlife Service terms and would be accompanied by a statement of "likely…" or "not likely to adversely affect" the species or critical habitat

REGULATIONS AND POLICIES

Current laws and policies require that the following conditions be achieved for species of special concern in the Park:

Desired Condition	Source
Federal and state-listed threatened and endangered species and their habitats are sustained.	Endangered Species Act NPS Management Policies 2001(2000) National Environmental Policy Act
Populations of native plant and animal species function in as natural condition as possible except where special management considerations are warranted	Executive Order 13112, Invasive Species NPS Management Policies 2001(2000)

IMPACTS OF ALTERNATIVE A-NO ACTION

Impact Analysis

The bald eagle roosting and nesting sites and peregrine aeries are well away from the areas where the AMLs are located. There would be no direct or indirect impact upon T& E Species or Species of Special Concern since there would be no further disturbance.

Cumulative Effects

There would be a no cumulative effects upon T & E Species or Species of Special Concern since there would be no disturbances.

Conclusion

There would be no direct, indirect and cumulative effects on T&E Species or Species of Special Concern.

Because there would be no major adverse impacts to a resource whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of Bighorn Canyon National Recreation Area; (2) key to the natural or cultural integrity of the recreation area; or (3) identified as a goal in the recreation area’s general management plan or other relevant National Park Service planning documents, Alternative A would result in no impairment of the recreation area’s resources and values.

IMPACTS OF ALTERNATIVE B-PREFERRED ALTERNATIVE

Impact Analysis

Potential threatened or endangered species in Bighorn Canyon NRA include the bald eagle and the recently de-listed peregrine falcon. None of the mineral sites are in suitable habitat for the bald eagle. Extensive surveys of the canyon and review of the records for peregrine aeries have revealed no aeries near the sites at the canyon rim. There are no areas of critical habitat for these species in the area of the proposed action. The three bat species of special concern are found in the limestone caves of the Pryor Mountains. The milk snake was found in the seeps at the base of Sykes Mountain, well away from the areas where the AML's are located.

The cushion plant communities have a number of plant species endemic to these windswept plateaus. Four of these are on the Montana and Wyoming list of species of concern. They are: Erigeron allocotus, Stanleya tomentosa, Astragalus oreganus and Eriogonum brevicaule var.canum. On a plant survey, Erigeron allocotus was found near some of the sites but these plants were not found on the site. Before re-contouring of each site, the site and access route will be rechecked for the presence of these plants and the route and method of re-contouring modified to preserve these plants. With the resurvey for the plant species of concern being done during the time of year when the plants are easily identifiable and just before re-contouring, the presence of the species of concern near or on the AML's can be detected with a good degree of certainty.
The early successional alien plants that may appear short-term on the newly reclaimed AML's have little potential for invading the habitat of the plant species of concern.

Direct Impacts: There would be negligible direct impacts on the bald eagles or peregrine falcons. There may be minor impacts on the plant species of special concern with the loss of a few individuals.

Indirect Impacts: There would be no discernable indirect impacts on T&E species or plant species of special concern.

Cumulative Effects

None expected since this is a one-time event for each cluster of mining sites with no further intervention except for monitoring and some hand weeding.

Conclusion

There could be minor and short-term direct effects upon T&E Species and species of special concern. There would be no indirect and cumulative effects on these species.

Because there would be no major adverse impacts to a resource whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of Bighorn Canyon National Recreation Area; (2) key to the natural or cultural integrity of the recreation area; or (3) identified as a goal in the recreation area's general management plan or other relevant National Park Service planning documents, Alternative B would result in no impairment of the recreation area's resources and values.

RESOURCE TOPIC 4- ARCHEOLOGICAL RESOURCES

METHODOLGY

Certain important research questions about human history can only be answered by the actual physical material of cultural resources. Archeological resources have the potential to answer, in whole or in part, such research questions. In order for an archeological resource to be eligible for the National Register of Historic Places it must meet one or more of the following criteria of significance: A) associated with events that have made a significant contribution to the broad patterns of our history; B) associated with the lives of persons significant in our past; C) embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic value, or represent a significant and distinguishable entity whose components may lack individual distinction; D) have yielded, or may be likely to yield, information important in prehistory or history. In addition, the archeological resource must possess integrity of location, design, setting, materials, workmanship, feeling, association (National Register Bulletin, *Guidelines for Evaluating and Registering Archeological Properties*) Bighorn Canyon National Recreation Area has two archeological sites on the National Register of Historic Places: the Bad Pass Trail and the Pretty Creek Archeological Site. There were twelve AML's that had access across the Bad Pass Trail. None were actually near the cairns of the Bad Pass Trail. These AML's were reclaimed in 2000. Four of the larger AML's were reclaimed with rubber-tired backhoe since the old mining access ran between cairns over solid rock. The backhoe left no tracks in the rock access and no damage to the features of the trail. The other eight AML's were re-contoured by hand since there was no safe backhoe access across the Bad Pass Trail. The Pretty Creek Site in along a riparian area that is well away from the AML's.

At the inception of the program to reclaim the AML's, consultation was done with the archeologist working at Bighorn Canyon National Recreation Area. The recommendation was to be sure that all AML sites were documented by photographs and

written descriptions and that the claims markers were also documented. The GIS layers created from extensive work on the archeological features in the 1970's were accessed and used in the process of mapping and evaluation the AML's. The only archeological site that was near the AML's or the access to the AML's was the Bad Pass Trail. There were no other AML's near mapped archeological sites. Because of the amount of disturbance involved in creating the AML's, the NPS archeologist felt that the potential for significant new archeological finds was low but did recommend that the mounds and access be evaluated for flaking sites and teepee rings. This was done in the 1999 mapping of the AML's as well as looking for proximity to other cultural resources. Each site had a good photograph, GPS coordinates and a description. Each mining claim marker was photographed and had a GPS coordinate. Since erosion can reveal new flaking sites or small artifacts, each site and access will be rechecked before reclamation by an archeological technician.

For purposes of analyzing impacts to archeological resources either listed in or eligible to be listed in the National Register, the thresholds of change for intensity of an impact are defined below:

Negligible: Impact is at the lowest levels of detection - barely measurable with no perceptible consequences, either adverse or beneficial, to archeological resources. For purposes of §106, the determination of effect would be no adverse effect.

Minor: **Adverse-** disturbance of a site(s) results in little, if any, loss of significance of integrity and the National Register eligibility of the site(s) is unaffected. For purposes of section 106, the determination of effect would be no adverse effect. **Beneficial**-maintenance preservation of a site(s). For purposes of §106, the determination of effect would be no adverse effect.

Moderate: **Adverse**- disturbance of a site(s) does not diminish the significance or integrity of the site(s) to the extent that its National Register eligibility is jeopardized. For purposes of Section 106, the determination of effect would be adverse effect. **Beneficial -**stabilization of the site(s). For purposes of §106, the determination of effect would be no adverse effect.

Major: **Adverse-**disturbance of a site(s) diminishes the significance and integrity of the site(s) to the extent that it is no longer eligible to be listed in the National Register. For

purposes of Section 106, the determination of effect would be adverse effect. **Beneficial** -active intervention to preserve the site. For purposes of §106, the determination of effect would be no adverse effect.

REGULATIONS AND POLICIES

Current laws and policies require that the following conditions be achieved in the park:

Desired Condition	Source
Archeological sites are identified and inventoried, and their significance is determined and documented Archeological sites are protected in an undisturbed condition unless it is determined through formal processes that disturbance or natural deterioration is unavoidable In those cases where disturbance or deterioration is unavoidable, the site is professionally documented and salvaged.	National Historic Preservation Act; Executive Order 11593; Archeological and Historic Preservation Act; Archeological Resources Protection Act; the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation; Programmatic Memorandum of Agreement Among the NPS, Advisory Council on Historic Preservation, and the National Council of State Historic Preservation Officers (1995); NPS Management Policies

IMPACTS OF ALTERNATIVE A-NO ACTION

Impact Analysis

There would be no further impact on the already disturbed potential archeological artifact sites since there would be no action in the area of the AML's. There would be no direct or indirect adverse impacts to archeological resources.

Cumulative Effects

There would be a no cumulative effects upon archeological resources since there would be no further disturbances.

Conclusion

There would be no direct, indirect and cumulative effects on archeological resources.

Because there would be no major adverse impacts to a resource whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of Bighorn Canyon National Recreation Area; (2) key to the natural or cultural integrity of the recreation area; or (3) identified as a goal in the recreation area's general management plan or other relevant National Park Service planning documents, Alternative A would result in no impairment of the recreation area's resources and values.

IMPACTS OF ALTERNATIVE B-PREFERRED ACTION

Impact Analysis

The rocky plateaus are low probability for archeological sites according to the Bighorn Canyon National Recreation archeologist who was consulted at the beginning of the AML reclamation project. There is some potential for small flaking sites and teepee rings but the rocky plateaus did not appear to be favored as camping sites or stone working sites. The AML's with access across the Bad Pass Trail have already been reclaimed without impact on the Bad Pass Trail. Extensive archeological surveys of Bighorn Canyon NRA were done in 1970-71 and 1979. The locations have been digitized and entered into ArcView. When this sites are put on a map with the mineral exploration sites, the only archeological sites close to the mineral sites or access routes are the previously described Bad Pass Trail cairns. No additional archeological sites were found during the survey and mapping of the AML's in 1999. If there were Native American artifacts along the previous access routes or on the excavations, the integrity of the site has already been impaired by the mineral exploration. However, each mound and access route will be re-checked for the presence of artifacts by an archeologist or person trained as a paraprofessional archeological technician before re-contouring. If there are any findings, they will be assessed by an archeologist before proceeding.

Direct Impacts: There would be negligible direct adverse impacts to archeological resources because of lack of proximity to these resources and the amount of disturbance that occurred during mineral exploration.

Indirect Impacts: There may be negligible indirect impacts to archeological resources from the increased access of the public to the back country via the marked old mining roads.

Cumulative Effects

None expected since this is a one-time event for each cluster of mining sites with no further intervention except for monitoring and some hand weeding.

Conclusion

There would be negligible direct, indirect and cumulative effects on archeological resources.

Because there would be no major adverse impacts to a resource whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of Bighorn Canyon National Recreation Area; (2) key to the natural or cultural integrity of the recreation area; or (3) identified as a goal in the recreation area's general management plan or other relevant National Park Service planning documents, Alternative B would result in no impairment of the recreation area's resources and values.

RESOURCE TOPIC 5- VISUAL RESOURCES AND TOPOGRAPHY

METHODOLOGY

The condition of the visual resources and alteration to topography was assessed during the inventory of the abandoned mineral exploration pits. Like a cultural landscape, a natural landscape should have a spatial organization of its topography, geological features, vegetation and water drainage patterns that accurately conveys how the natural system works. For purposes of analyzing potential impacts to visual resources and topography, the thresholds of change for the intensity of an impact are defined as follows:

Negligible: The changes on topography are at the lowest level of detection- barely perceptible and not measurable

Minor: The changes in topography are slight but detectable. There would be no alteration of the hydrology of the disturbed area. A visitor might notice the disturbance but would not find it esthetically distracting.

Moderate: Changes in topography are readily apparent. There would be enough disturbance of the hydrology of the disturbed area to decrease the amount of naturally occurring revegetation. The disturbance would be readily apparent to a visitor and somewhat esthetically distracting.

Major: Changes in topography are severe. The disturbances are deep and large and disrupt the normal sequence of geological strata. The hydrology of the disturbed area is so severe that

natural revegetation is severely hindered. The disturbance is exceptionally distracting to the visitor.

REGULATIONS AND POLICIES

Current laws and policies require that the following conditions be achieved in the park:

Desired Condition	Source
Significant topographic features are protected	National Park Service's Management Policies 2001(2000)
The visual components of the landscape remain unimpaired	

IMPACTS OF ALTERNATIVE A-NO ACTION

Impact Analysis

There would be no further impact on the already disturbed mineral exploration sites but they would continue to be highly visible to visitors and in some clusters, exceptionally visually distracting. The hydrology of the sites would remain impaired enough to cause significant slowing of the process of natural revegetation. The topography would remain disturbed with loss of the normal sequence of geological strata in the larger AML sites. Since the disturbance occurred over forty years ago, the no action alternative will not result in additional disturbance. However the direct impact of the old disturbance in visual resources and topography would continue to be moderate to major, depending upon the size and density of AML's in each cluster. There would be a continuing moderate indirect effect from failure of native vegetation to return because of the impaired hydrology of the pit and mound structures resulting in further changes in the visual components of the landscape. Both direct and indirect effects would be long-term.

Cumulative Effects

There would be minor cumulative effects upon visual resources and topography related to continuing erosion over time.

Conclusion

There would be no direct or indirect effects upon the visual resources as they are at present. However with no action, the continuing presence of the previous disturbance would result in moderate to major impact upon visual resources and topography that would be long-term. There would be mild cumulative effects on visual resources and topography.

Because there would be moderate adverse impacts to a resource whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of Bighorn Canyon National Recreation Area; (2) key to the natural or cultural integrity of the recreation area; or (3) identified as a goal in the recreation area's general management plan or other relevant National Park Service planning documents, Alternative A would result in no impairment of the recreation area's resources and values.

IMPACTS OF ALTERNATIVE B-PREFERRED ALTERNATIVE

Impact Analysis

The excavations for uranium exploration tend to occur where marine limestones interface with other strata. The process of digging the exploratory pits has disturbed the normal placement of one stratum over another and caused multiple disturbances in the topography of Bighorn Canyon National Recreation Area. Most of these disturbances are small and noticed only when one is in the immediate area. Others are large, deep and in dense clusters. These clusters have a significant visual impact upon the visitor and represent significant disruption of the normal topography. Re-contouring of the AML's will be a surface event that will not further disrupt the arrangement of the geologic strata. While the original strata and contours cannot be reconstructed, the topographic contours of each site will be returned to a natural looking appearance that approximates the original contour.

Direct Impacts: Adverse direct impacts would be negligible. There would be an immediate beneficial impact on visual appearance and topography with re-contouring. The amount of benefit would depend upon the amount of the initial disturbance of topography and the success in getting the contents of the mounds back into the pits. Even in sites, where the excavated soil has been pushed over the canyon rim, a good improvement in visual appearance could be achieved by smoothing out the contour and disguising the site with large rocks and dead junipers.

Indirect Impacts: There would be a beneficial indirect impact on the soil and vegetation by restoring a more natural appearing contour. This would also improve the visual appearance of the AML's beyond that of the initial re-contouring.

Cumulative Effects

There would be no adverse cumulative effects upon visual resources and topography. Over time, the reclamation of these disturbances would change the topography of these rocky plateaus back to a natural appearance.

Conclusion

There would be negligible adverse direct, indirect and cumulative effects on visual resources and topography. The action of re-contouring the AML's would result in beneficial direct, indirect and cumulative effects.

Because there would be no major adverse impacts to a resource whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of Bighorn Canyon National Recreation Area; (2) key to the natural or cultural integrity of the recreation area; or (3) identified as a goal in the recreation area's general management plan or other relevant National Park Service planning documents, Alternative B would result in no impairment of the recreation area's resources and values.

RESOURCE TOPIC 6-VISITOR USE AND EXPERIENCE

METHODOLOGY

Visitor surveys and personal observation of visitation patterns combined with what is available to visitors under current management were used to estimate the effects of the alternatives. Visitor requests for more information on hiking possibilities in Bighorn Canyon National Recreation Area and their feedback on the new trails was considered. For purposes of analyzing potential impacts to visitor use and experience, the thresholds of change for the intensity of an impact are defined as follows:

Negligible: Visitors would likely not be aware of changes associated with the presence of the excavations from previous mineral exploration.

Minor: Visitors would likely be aware of the changes associated with the excavations from previous mineral exploration and its effect on their own use and enjoyment of park resources. However, the changes in visitor use and experience would be slight and likely short-term

Moderate: Visitors would be aware of the effects associated with the excavations from previous mineral exploration and its effect on their own use and enjoyment of park resources. Changes in visitor use and experience would be readily apparent and likely

long-term. The park would remain available for other visitor experience and use without derogation of park resources and values, but visitor satisfaction may be measurably affected.

Major: Visitors would be highly aware of the effects associated with the excavations from previous mineral exploration and its effect on their own use and enjoyment of park resources. Changes in visitor use and experience would be readily apparent and long-term. The change in visitor use and experience proposed in the alternative would preclude future generations of some visitors' enjoyment of park resources and values.

IMPACTS OF ALTERNATIVE A-NO ACTION

Impact Analysis

The unreclaimed mineral exploration sites would continue to be obvious disturbances along areas used as trails. The larger clusters of AMLs would continue to be esthetically very distracting to most visitors resulting in low use of trails near the larger clusters. The larger sites on Barry's Island and above Layout Creek Canyon may present a safety risk to people who might use the sites inappropriately. There would be moderate direct impact upon the quality of the experience of visitors using the old mining roads as trails that would be long-term. There would be minor indirect impacts from the AML's resulting in inappropriate interpretation of the natural landscape that would be long term.

Cumulative Effects

There would be moderate cumulative effects upon visitor use and experience as more abandoned mining roads are utilized as visitor use trails.

Conclusion

There would be moderate direct, indirect and cumulative effects on visitor use and experience

IMPACTS OF ALTERNATIVE B-PREFERRED ALTERNATIVE

Impact Analysis

The process of reclamation may impair visitor use temporarily during the actual process of re-contouring the sites but once the sites are recontoured and seeded, normal use of the trails may resume. There will be an immediate improvement in the visual appearance and safety of these excavations. Visitor use and enjoyment of these abandoned mining roads should increase.

Subsequent monitoring and weed control would have on impact no visitor use of the trails.

Direct Impacts: There would be minor adverse impact upon visitor use and experience that would be very short term. Beneficial impacts would be immediate and of moderate intensity.

Indirect Impacts: There would be negligible indirect impacts.

Cumulative Effects

There would be moderate beneficial cumulative effects upon visitor use and experience in that as the old mining roads are made more attractive as trails, use would be increased. As the AML's are reclaimed, more of the abandoned mining roads would be available to the visitor for hiking. The range of recreational opportunities to the visitor would be increased.

Conclusion

There would be minor, short-term adverse direct effects on the visitor use and experience. There would be negligible indirect and cumulative effects. Alternative B would result in moderate beneficial effects from safer, more natural appearing trails and more trails that have been developed from abandoned mining roads.

CONSULTATION/COORDINATION

AGENCIES/TRIBES/ORGANIZATIONS/INDIVIDUALS CONTACTED

Benjamin, Pam- Vegetation Ecologist, Intermountain Regional Support Office,

Byrne, Bob- Assistant Superintendent, Bighorn Canyon National Recreation Area

Robert P. Bohman- Reclamation Specialist, Geology and Cultural Resources, Montana Department of Environmental Quality.

Bureau of Land Management- Cody, Wyo. and Billings, Mont. Offices

Custer National Forest

Finley, Chris- Archeologist, Bighorn Canyon National Recreation Area

Gianakos, Laura - Water Specialist, Bighorn Canyon National Recreation Area

Hanebury, Lou- Wildlife Biologist, US Fish and Wildlife Service, Billings, Montana

Lasko, Rick-Integrated Program Resource Manager, Bighorn Canyon National Recreation Area

Peters, T., Maps and personal communication about location of Peregrine Falcons in Bighorn Canyon NRA

Simpson, Brooke-Archeologist, Bighorn Canyon National Recreation Area

Stewart, Shawn-Wildlife Biologist, Montana Department of Fish, Wildlife and Parks

Tribal Chairman of the Crow Nation

Wilmoth, Stan-State Archeologist, Montana State Historic Preservation Office,

Wyoming Game and Fish

York, Darryl, Wildlife Biologist, US Fish and Wildlife Service, Cheyenne, Wyoming

PREPARER

Suzanne Morstad-Vegetation Ecologist, Bighorn Canyon National Recreation Area

LIST OF ENVIRONMENTAL ASSESSMENT RECIPIENTS

BLM, Cody, Wyoming and Billings, Montana Offices

Custer National Forest, Beartooth District

Montana Department of Environmental Quality

Montana Department of Fish, Wildlife and Parks

Tribal Chairman of the Crow Nation

Wyoming Game and Fish

US Fish and Wildlife Service, Cheyenne Wyo. Office

Public Announcement to all Local Media

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APPENDIX A: NEWS RELEASE AND REQUEST FOR COMMENTS

FOR IMMEDIATE RELEASE **Contact: Suzanne Morstad**
December 10, 2001 **(307) 548-2251**

RECLAMATION OF ABANDONED MINERAL SITES

Bighorn Canyon National Recreation Area is in the initial stages of planning and public involvement for a project to reclaim abandoned mining exploration sites.

In the uranium boom period of the 1950's over 350 pits for uranium exploration were excavated in Bighorn Canyon National Recreation Area. These pits vary in size from less that 0.01 acre to 5.6 acres. In the arid climate, these sites show little evidence of natural recovery and remain as ugly scars on the land almost 50 years later. The National Park Service is planning to recontour these mining sites using a combination of backhoe and/or hand recontouring followed by seeding with native plants of the same species as are nearby. This project will be carried out over a period of about 10 years.

As part of the "scoping" process for this project, the National Park Service is asking the public to become involved and to help shape project development. The purpose of this notice is to solicit comments on what concerns might exist and on ideas that might be useful in further refining the project.

Any questions, suggestions or concern about the proposed project or requests for more information should be sent to project manager Suzanne Morstad at (307) 548-2251 or mailed to Bighorn Canyon NRA, 20 Hwy 14Alt, Lovell, Wyo. 82431. E-mails should to

sent to Suzanne_Morstad@nps.gov. Please submit your comments by January 11, 2002.

APPENDIX B: SCOPING STATEMENT

SCOPING STATEMENT
REQUEST FOR PUBLIC COMMENTS

NATIONAL PARK SERVICE
Bighorn Canyon National Recreation Area

Project Name: Reclamation of Abandoned Mineral Lands Project
Counties: Bighorn County, Wyo. and Carbon County, Mt.

Legal Description: Multiple sites in South District of Bighorn Canyon NRA

Proposed Decision Date: Late Winter 2002
Proposed Implementation Date: July 2002-Nov 2012

DEAR INTERESTED PARTY:

Introduction-Bighorn Canyon National Recreation has over 350 abandoned mineral exploration sites from mineral exploration in the 1950's scattered over the park. These sites are visually ugly as well as bare of vegetation.

Under the Surface Mining and Reclamation Act, these pre 1972 mining disturbances need to be reclaimed, especially if they

represent a hazard. Reclamation of these sites will return the visual appearance of the landscape to a natural appearance and restore the native vegetation in these disturbed areas.

The National Park Service is proposing an Abandoned Mineral Lands Reclamation
Project to recontour these exploration sites and revegetate them with native plants.

We feel that this project will restore the natural appearance of these disturbed areas, increasing the quality of the visitor's experience as well as increasing native forage.

PUBLIC INVOLVEMENT-

Bighorn Canyon NRA is in the initial stages of a planning and public involvement process for this Reclamation of Abandoned Mineral Lands Project.

As a starting point, we are suggesting a "proposed action" in this scoping statement that represents an opportunity for the public to become involved and to help shape the project development and implementation. The proposed action is one alternative we could implement to meet the goals for the park. It may or may not be the final decision. This proposed action gives us a place to begin our analysis and allows the public to begin suggesting other ways we might achieve the goals.

By developing a "proposed action", the public has a proposal to react to, which helps people focus on what concerns might exist and what comments to make to be most useful in further refining the program. We need to involve you and identify ways to modify the initial proposal, if needed, based upon local residents knowledge of the area and possible concerns about how the program is implemented. This is why your comments and input are important.

The purpose of this letter is to solicit written comments from all concerned parties to help us design and implement this program. Your comments and suggestions are needed and encouraged. Project alternatives will be determined and environmental consequences analyzed during the National Environmental Policy Act (NEPA) process initiated by this scoping letter. Additional information, the purpose, need and proposed action are described in the following sections.

This reclamation project was started in 1998. At that time the project fit the criteria for "categorical exclusion" under the National Environmental Policy Act (NEPA). However under Director's Order # 12, the environmental consequences of the

proposed project must be re-examined. If no significant environmental impacts are found, the project will continue in 2002 and be completed around 2012.

BACKGROUND

In the 1950's, in response to the cold war and demand for nuclear energy, the area that later became Bighorn Canyon National Recreation Area was intensively explored for possible uranium deposits. Heavy equipment was sent out over the landscape to make exploratory gouges for rock and soil samples. No uranium bearing rock was found and no commercial uranium mines were developed except for the Titan mine on the east side of Bighorn Canyon. In accordance with the practices of the time, the exploratory pits and mounds were not recontoured and the remains of these exploratory sites now pock the surface of Bighorn Canyon NRA. Over 350 of these sites have been found and mapped and it is estimated that probably another 5% will be found.

These mineral exploration sites are now nearly 50 years old and have shown little evidence of natural reclamation in the arid climate of Bighorn Canyon NRA. The rainfall is so sparse that there has been little or nor erosion of the mounds associated with these sites. With the altered slope and drainage coupled with the arid climate, vegetative recovery has been very slow. The sites are clearly visible, forming multiple disturbances over the landscape of Bighorn Canyon NRA.

While most of the sites are small (0.01) acre, the total acreage (around 19 acres) is large enough to represent a significant loss of forage to grazing animals of Bighorn Canyon NRA. Most of these sites are devoid of vegetation and not showing evidence of natural revegetation because of the altered hydrology of the sites.

Many of these sites are along old mining roads that are being marked for use as visitor use trails. Some of the larger sites have potential for danger if unsupervised children use them for inappropriate play. Also the sites along these trails to the canyon rim are ugly, reducing the quality of the visitor experience. Other mining roads literally are "roads to nowhere and need reclamation as much as the exploration pits.

The National Park Service has done an inventory of these sites, mapping, photographing and describing their characteristics. They vary in size from less than 0.01 acres to 5.6 acres with most of them under 0.02 acres. The total acreage so far is 18.6 acres. The sites are spread out over the foothill areas of the park, often in potentially lovely natural areas along the canyon rim.

SAFETY-

The abandoned mineral sites have been checked with a Geiger counter for radiation in 1991. No readings higher than 0.1mRem were found.

The recontouring of the sites will be done either by backhoe or hand. No backhoe will be sent into dangerous situations such as close to the canyon rim. Some of the sites were excavated in areas that would not be allowed today because of current safety regulations. Any site that cannot be recontoured safely, will be left as is.

Because the abandoned mineral sites are well away from the usual visitor use areas, hazards to the community from reclamation are minimal. Visitors will be kept away from the sites during use of heavy equipment

PURPOSE AND NEED

As previously mentioned, the National Park Service is obligated to reclaim its abandoned mineral lands. These are heavily disturbed areas that will not regenerate naturally for many generations.

EXISTING CONDITIONS (Where we are now)-Exploration for uranium in the 1950's has left over 350 deep gouges scattered on the foothill and plateau regions of Bighorn Canyon NRA. These gouges range is size from less than 0.01 acre and one foot deep to over half and acre and five feet deep. The largest site is 5.6 acres but this site was probably an abandoned gravel pit.

These multiple abandoned mineral exploration sites have shown no evidence of natural reclamation since they were dug. They represent over 18 acres of land lost as forage and are visually ugly, unnatural scars in an otherwise pristine desert landscape.

The process of regeneration is so slow in the desert climate of Bighorn Canyon NRA that natural reclamation is measured in geologic time rather that historic time. Without intervention, these mineral sites will probably be visible long after any memory of the original disturbance has faded.

PROJECT GOALS-

The primary purpose of the abandoned mineral site reclamation project is to restore these sites to as natural an appearance as possible.

- The contour of each site will approximate the contour of before the mining disturbance.
- The vegetation will be of the same native species as the adjacent areas at a density of at least 80% of the vegetation density of nearby areas.
- There will be no noxious weeds on these sites. Some early successional weeds that have a history of disappearing in the course of succession are acceptable.
- The natural slope and hydrology of the sites will be restored.
- The project will result in minimal collateral damage to adjacent and access areas.

The project is needed to:

- Meet the resource management goals of Bighorn Canyon NRA which are to reclaim areas of major disturbance.
- Improve the quality of visitor experience, especially along those mining roads used as trails and in the backcountry along the rim of the canyon.
- Decrease the risk of injury from unauthorized and inappropriate use of the deeper pits and mounds.
- Decrease the amount of land lost to use for grazing.

DESIRED CONDITIONS(Where we wish to be)-The 350 plus abandoned mineral sites will be recontoured using the techniques recommended by the National Park Service for reclamation in natural areas. After seeding with the seed of native plants and use of appropriate amendments, there will be a cover of native plants that is al least 80% that of surrounding areas within five years. The normal slope and hydrology of these sites will be restored.

After reclamation, the areas where these mineral exploration sites are will have a natural looking appearance and palatable native vegetation. To the experienced eye, the sites may still be discernable but overall, the function and appearance of these sites will be significantly improved. The process of succession will be significantly speeded up by the reclamation process.

Evidence of the access and equipment used for reclamation will be minimal and erased in less than 10 years.

THE PROPOSED ACTION

By developing a proposed action, the public has a proposal to react to, which helps people focus on what concerns might exist

and what comments to make to be most useful in further refining the project.

Who is proposing this project?

The project was proposed by the National Park Service in response to the mandate to reclaim heavily disturbed lands and abandoned mineral lands as part of the Government Performance and Results Act of 1993.

National Park Service personnel are seeking public comments to help plan and carry out this program. The purpose of scoping is to identify issues and concerns related to the proposed actions. In addition, scoping may identify additional information and management opportunities that may be incorporated into the proposed action as well as formulating alternatives to the proposed actions. Input will be used to determine the nature and complexity of the proposed action, identify environmental and other issues to the proposed action and determine the level of NEPA analysis necessary.

Why is the project being proposed?

The rationale for the project is described in the introduction, background and purpose and need sections.

Where is the proposed project?

The abandoned mineral lands to be reclaimed under this project are located in Carbon County, Mt. And Bighorn County, Wyo. within the borders of Bighorn Canyon National Recreation Area. The lower part of the project is approximately 18 miles northeast of Lovell, Wyo.

When would this project occur?

As explained previously, the project has already been started. If no significant environmental impacts from the project are found, the project will continue in summer of 2002 and continue for 10 years with continued monitoring after that for another five years.

What is being proposed?

An interdisciplinary team of resource specialists would review and analyze the effects of the proposed program in relation to issues raised during the internal and public scoping process. The team will develop program design features for implementation of the project.

The proposed action would be designed to comply with the National Park Service standards for reclamation of disturbed lands in natural areas and Director's Order # 12.

The abandoned mineral exploration sites have already been mapped, described, analyzed and photographed. Preliminary data on the results of re-contouring and seeding of the sites completed in 1999 has been collected and is being used in preparation of the environmental analysis. As stated previously, when this project was started, it fit the criteria for categorical exclusion under NEPA.

The specifics of the proposed action and project implementation include:

- Each mineral site will be recontoured by backhoe or by hand depending upon size of the site, backhoe access and presence of sensitive plant species or archeological features. It is recognized that disturbances created by heavy equipment are best recontoured by heavy equipment. The results in restoring normal hydrology are better and damage from the equipment is minimal if appropriate precautions are taken.
- The heavy equipment used will be a small rubber tired backhoe or trackhoe using the old mining access roads for access. Work with heavy equipment will be done only when the soil is dry to reduce the risk of compaction. In Bighorn Canyon NRA and other units of the National Park Service this approach has been found to cause minimal environmental damage in either the access or adjacent areas.
- Hand contouring will be done on smaller sites, areas with unusually good vegetative growth and in areas that have sensitive plant species or historical or archeological features that would be adversely impacted by heavy equipment.
- Each site will be seeded with a mixture of native grasses, shrubs and forbs from a local native seed nursery. The seed will be certified as weed free. The species selected will be the same as in the adjacent areas. The diversity will not be the same since seeds for many of the plants in the adjacent area are not available and in a desert, collection of native seeds is extremely time consuming and seeds often not viable. The sites are small enough so once the normal hydrology has been restored, seeds from nearby plants have good potential to drift in and germinate.
- Seeding will be done in the fall to take advantage of winter snows and early spring rains since summer watering is not feasible in these remote sites.
- During the reclamation process, soil amendments may be used and local duff and branches put on the sites to provide windbreaks and microclimates. This has been found to be effective in other NPS reclamation projects.

- After reclamation, each site will be monitored for at least five years for noxious weeds and seeding failure.
- None of the sites to be reclaimed in this project are in visitor use areas or along the roads.
- All sites will be assessed for the presence of archeological and historical features before reclamation with access and method of reclamation determined by the potential risk to such features.
- All sites will be assessed for the presence of sensitive species and plant communities before reclamation with access and method of reclamation determined by the potential risk to these unique communities and sensitive species.

POSSIBLE ALTERNATIVES

- No action alternative –The abandoned mineral exploration sites will not be reclaimed and will continue to be a visible disturbance for several hundred years
- Alternative actions would be analyzed if issues and concerns related to the proposed action were identifies and could not be addressed through program planning or mitigation
- Proposed action-The project would be authorized as proposed

NATURE OF DECISION

The decision would be made is whether or not to authorize the proposed Abandoned Mine Reclamation Project or an alternative to the program. Also the decision could include what mitigation measures need to be applied to the program. Based upon public comment from this scoping notice and environmental analysis, the National Park Service determine whether significant issues or concerns exist. If there are any, they will be addressed in the analysis and eventual decision.

CONTACTS

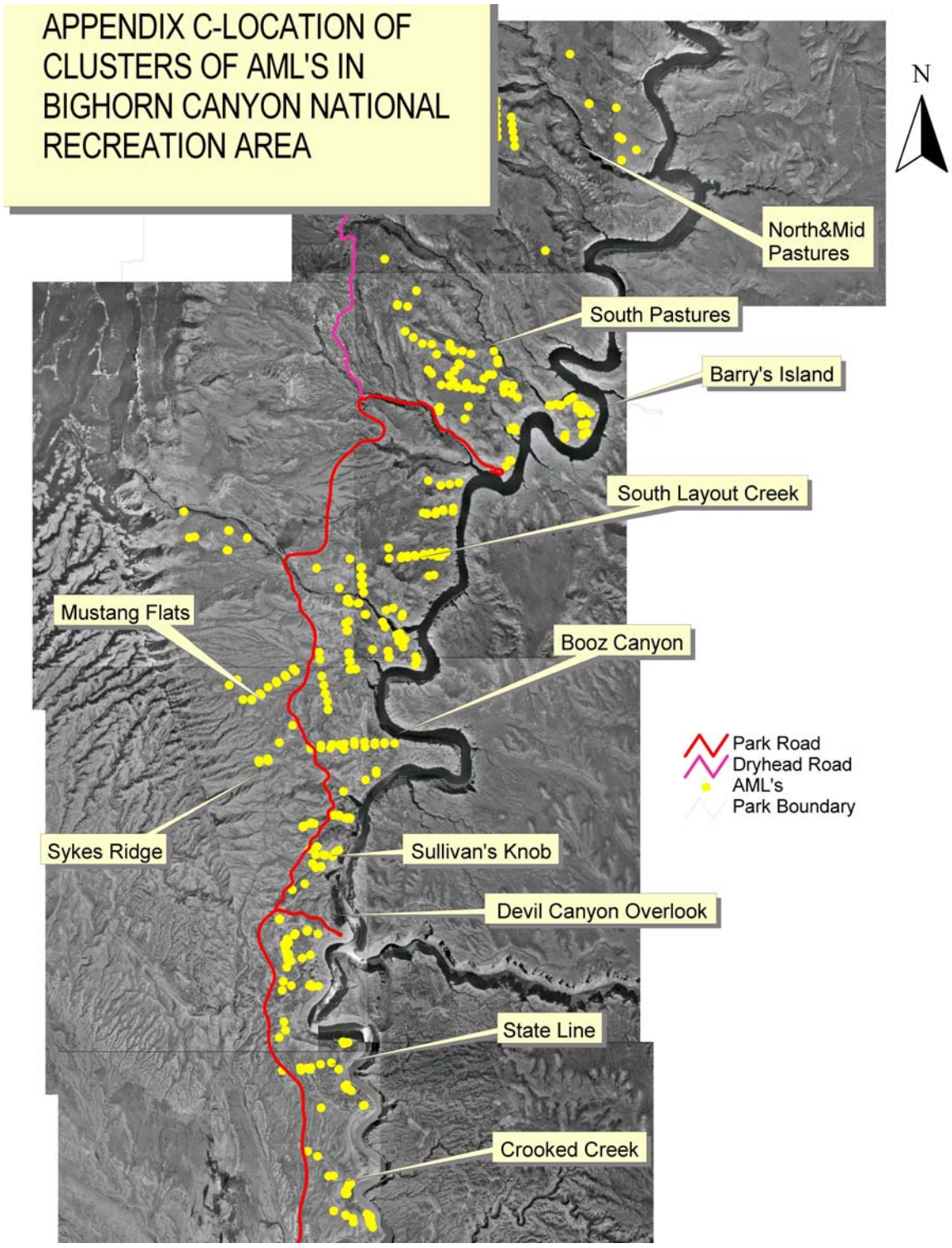
The public is provided this opportunity to identify and submit issues and concerns they feel the National Park Service should address. If you feel we have overlooked something or have additional information, comments should be as specific as possible to assist us in the analysis. To be most helpful, comments should be submitted in writing no later than 2/08/02

For further information, contact project leader Suzanne Morstad at (307) 548- 2251. Written comments can be mailed to Attention- Suzanne Morstad, Bighorn Canyon National Recreation Area, 20 hwy 14A, Lovell, Wyo. 823431.

Please remember that your comments are important to us.

Sincerely,

Rick Lasko
Chief of Resource Management


APPENDIX C-LOCATION OF CLUSTERS OF AML'S IN BIGHORN CANYON NATIONAL RECREATION AREA
N
North&Mid Pastures
South Pastures
Barry's Island
South Layout Creek
Mustang Flats
Booz Canyon
Park Road
Dryhead Road
AML's
Park Boundary
Sykes Ridge
Sullivan's Knob
Devil Canyon Overlook
State Line
Crooked Creek

APPENDIX D: LETTER TO THE CROW NATION

United States Department of the Interior

National Park Service

Bighorn Canyon National Recreation Area

P. O. Box 7458

Fort Smith, Montana 59035

406-666-2412

In Reply Refer To:
A3815(BICA-SD)

October 2, 2002

Crow Tribal Council
ATTN: Acting Chairman
P.O. Box 159
Crow Agency, MT 59022

Dear Mr. Chairman:

Bighorn Canyon National Recreation Area is proposing an integrated weed management program for the park including the North District. This program would involve the use of multiple techniques to control weeds including mowing, release of weed eating insects, spraying and reseeding areas that have weeds because they are already bare of grasses. Some of these techniques such as mowing and spraying are already being used to some extent as part of ongoing management of the park. The sprays to be used are all approved for range use and safe for use near people and where cattle are grazing. In addition to park-managed lands, lands around Government Camp, the Yellowtail and Afterbay dams, the park is also responsible for weed control on the road to Three-Mile Access and the eleven-mile road to Ok-A-Beh.

The National Recreation Area is also working on reclamation of the approximately 350 abandoned uranium exploration sites in the South District of Bighorn Canyon National Recreation Area. The sites that are on existing mining roads will be re-contoured by backhoe where possible. The sites that are near to archeological sites, biologically sensitive areas, or are inaccessible to a backhoe will be re-contoured by hand. The sites will then be planted with native seed. Enclosed is a map showing the location of these sites and the known archeological sites.

Before proceeding with the full development of a detailed plan for weed control and further reclamation of the abandoned mineral sites, we would like to hear any concerns, suggestions or objections the Crow Nation might have to these activities. Please address your comments, in writing, to Chief, Resources Management, Rick Lasko, 20 Highway 14A East, Lovell, Wyoming 82431.

Sincerely,

Darrell J. Cook

APPENDIX E: CHECKLIST FOR EACH SITE BEFORE FINAL RECLAMATION

Evidence of historic or archeological artifacts on site

Access crosses historic or archeological sites that could be impacted by heavy equipment

Any of the four endemic species of concern on the site or the access route

Any close proximity to bald eagle or peregrine falcon nesting sites

Evidence of the pit being used a persistent waterhole for wildlife

Proximity to noxious weeds

Potential for impact on wetlands

Potential for disturbance of nesting in neotropical migratory birds

Potential for sediments impacting surface water

Presence or absence of mining markers that need documentation

Proximity to Vision Quest sites

Potential for socioeconomic or visitor use impacts

Recommended method of re-contouring

Any other concerns or needed mitigation

APPENDIX F: POTENTIAL T&E SPECIES AND SPECIES OF SPECIAL CONCERN

Common Name	Scientific Name	Status	Situation in Bighorn Canyon NRA
Leopard Frog	Rana pipiens	Sp of Concern	Wetlands well away from AML's
Milk Snake	Lampropeltis triagulum	Sp of Concern	Seep wetlands well away from AML's
Sturgeon Chub	Hybopsis gelida	Candidate	Bighorn River well away from AML's
Bald eagle	Haliaeetus leucocephalus	Threatened	Cottonwoods and side canyons well away from AML's
Mountain plover	Charadrius montanus	Candidate	One sighting in grasslands well away
Northern Goshawk	Accipter gentiles	Sp of Concern	May winter in yellowtail habitat, well away from AML's, migratory only
Peregrine falcon	Falco peregrinus	Recently Delisted	Canyon cliffs and east face of Pryors
Sharptail Grouse	Tympanuchus phasianellus	Sp of Concern	Grasslands in North District, well away from AML's
Black footed ferret	Mustela nigripes	Endangered	Not found in Bighorn Canyon
Black-tailed prairie dog	Cynomys ludovicanianus	Candidate	Not found in Bighorn Canyon, no suitable habitat
Canada lynx	Felis Lynx	Threatened	Not found in Bighorn Canyon
Hoary bat	Lasiureus cinereus	Sp of Concern	Found in caves away from AML's, no suitable habitat
Long–eared myotis	Myotis evotis	Sp of Concern	Found in caves away from AML's
Merriman's shrew	Sorex merriami	Sp of Concern	One sighting in 1984, no U.S. F&W

Records for AML area
Spotted bat Euderma maculatum Sp of Concern
Found in Caves and Visitor

Center wall, away from AML's
Swift fox Vulpes velox Candidate
Not found in Bighorn Canyon NRA

No suitable habitat
Townsend's Big-eared Bat Sp of Concern
Caves away from AML's
Corynorhinus townsendii

Sullivantia Sullivantia hapemanii Sp of Concern
Found in calcarious seeps,

well away from AML's
Persistant sepal Rorippa calycina Sp of Concern
Found along Bighorn River South
Yellowcress
of lake, away from AML's
Bighorn daisy Erigeron allocotus Sp of Concern
May be near some AML's

Hairy Prince's plume Stanleya tomentosa Sp of concern May be near some AML's

Oregon milkvetch Astragalus oreganus Sp of Concern May be near some AML's

Rabbit buckwheat Eriogonum brevicaule Sp of Concern May be near some AML's
var. canum